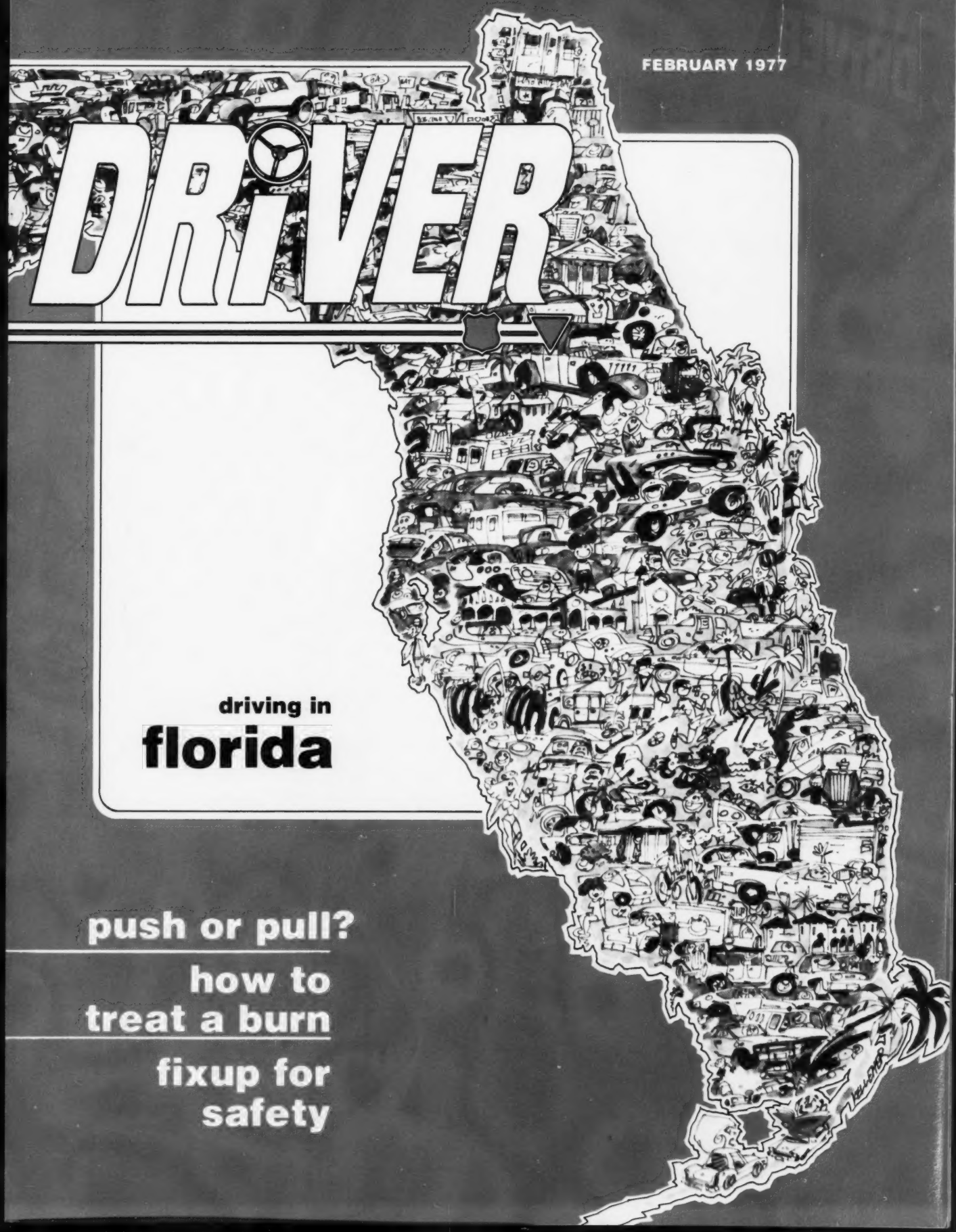
FEBRUARY 1977

DRIVER



driving in
florida

push or pull?

how to treat a burn

fixup for safety

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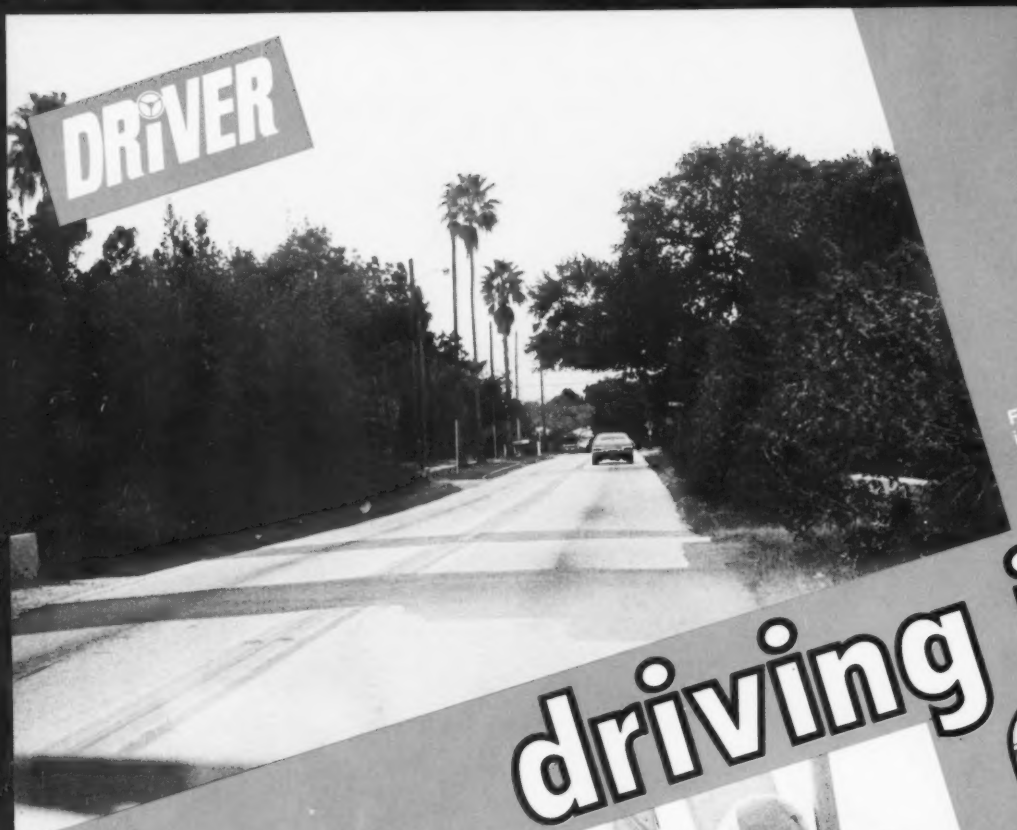
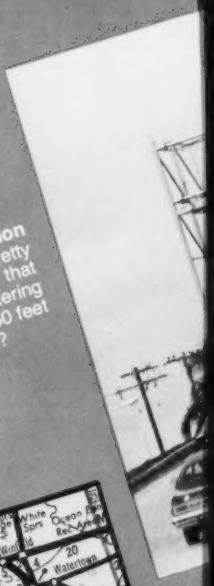
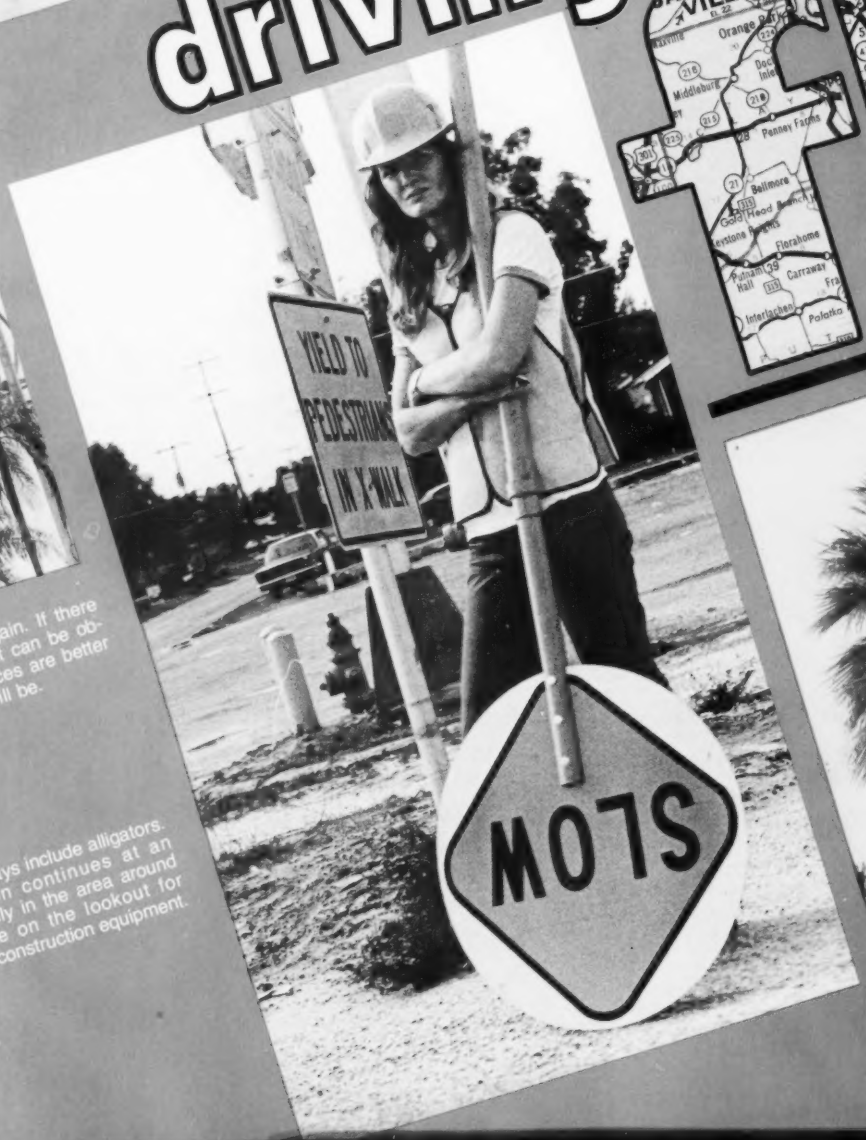
driving in



Florida's lush vegetation is surely pretty . . . pretty hard to see through, that is. There's a road entering from the right about 50 feet away. Do *you* see it?



Good ol' Florida vegetation again. If there is a sign or an intersection that can be obscured by a green thing, chances are better than even that, eventually, it will be.



Sights to see don't always include alligators. Highway construction continues at an amazing rate, especially in the area around Disney World, so be on the lookout for traffic controllers and construction equipment.

We doubt if Florida has too many unemployed sign painters! Although the state highway system is continually being improved, signs don't always keep pace. Signs are too small, and too much information is displayed. Driving in the Tampa/Saint Pete area requires that you know, in advance, the route you'll be taking.

At some time or another everyone dreams about a vacation in sunny Florida. Miles of crystal white beaches. Swaying palm trees. Beautiful, sunny weather. Each winter thousands of Americans make the dream come true and head south to the land of sunshine and flowers.

Military prople are no exception. In addition to the vacationers, Florida has become a retirement home for many. Attracted by the mild weather and numerous natural (and man-made) sights, retirees find Florida an attractive alternative to the old home town they left 20-odd years ago.

There are many ways to get to and see Florida. You can go by train, bus, or air. But the most popular and convenient way to see the maximum is by car.

During a recent three-month stay in Florida, I found many places easily accessible by private auto that would have otherwise been very difficult to see. Another advantage of motoring is that it allows you time to see places at leisure, spending as much or as little time in a place as you wish.

The double-five speed limit and high gasoline prices notwithstanding, more and more people are selecting this method of touring. In addition to the tourists, servicemen stationed at several airbases in Florida add to the number of traveling motorists you will encounter while driving through the state.

To make the most of a trip to Florida, it pays to have a little advance knowledge of places to go and some of the hazards to avoid, both on and off the highway. Florida has an excellent system of interstate highways, providing access to the major attractions in the state. Interstate 95 traverses the east coast from Jacksonville in the north to Miami, except for an uncompleted section between Fort Pierce and West Palm Beach. Interstate 4 runs from Daytona Beach to Tampa and St. Petersburg on the west coast. From Jacksonville to Pensacola, the traveler can use Interstate 10 except for short stretches in the central part of the panhandle. Finally, Interstate 75 bisects the state from the north to Tampa.

State roads, connecting the interstate system, are well constructed, but for the most part are only two-lane highways and are poorly lighted except in the large urban areas. Access roads, many nothing more than dirt tracks, are often concealed by foliage and require extra caution, especially during the early hours of dusk. Many Floridians are farmers, so watch for slow farm vehicles when driving through rural areas.

Another hazard, one that is unfamiliar to drivers from the larger industrial areas of the country, is wildlife. Deer, alligator, and an astonishing variety of furred and feathered denizens of the forest, can be found throughout the state. Unfortunately, they don't read signs and

continued

by
Capt CHARLES RAY, USA
Ft Bragg, NC

DRIVER

THE TRAFFIC SAFETY MAGAZINE FOR THE MILITARY DRIVER

FEBRUARY 1977

VOLUME 10 NUMBER 9

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DEPARTMENT OF THE AIR FORCE ■ HQ AIR FORCE INSPECTION AND SAFETY CENTER
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PUBLISHED IN COOPERATION WITH THE DEPARTMENT OF THE ARMY AND THE DEPARTMENT OF THE NAVY

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AFRP 127-1

Entered as a Controlled Circulation Rate Publication (USPS No. 335490) at Santa Ana, CA 92711.

SUBSCRIPTION—DRIVER is available on subscription for $8.65 per year domestic; $2.20 additional for foreign mailing, 75c per copy, through the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Changes in subscription mailings should be sent to the above address. Single copies will be sold and back copies will be furnished when available. Use of funds for printing this publication has been approved by Headquarters, United States Air Force, Department of Defense, Washington, D.C. No payment can be made for manuscripts submitted for publication. Contributions are welcomed, as are comments and criticism. Address all correspondence to the Editor, DRIVER Magazine, AFISC/SEDD, Norton AFB, CA 92409.

ATTENTION DEPT OF THE NAVY PERSONNEL: Address all queries concerning distribution to NAVSAFECEN, NAS, NORFOLK, VA 23511, Attn: Safety Publications Dept. All other correspondence will be welcomed by the Editor.

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Certain individuals shown in this magazine are not members of the Air Force and therefore do not conform to Air Force grooming standards.

THE EDITOR SPEAKS

DOUBLE CLUTCH

INSURANCE COSTS FOR VANS CLIMBING WITH CUSTOMIZING

Mr. or Ms. Van Owner: If the cost of your van insurance policy hasn't jumped dramatically in the last few months, be advised that it probably soon will, thanks to the customizing craze and recreational usage.

Until now most insurance companies have charged lower premiums for vans on the assumption they were basically business vehicles. Last November 1, however, Allstate Insurance Co., one of the nation's largest vehicle insurers, eliminated the discount and began treating all vans as passenger cars. Result: Liability insurance rates for vans went up by 11.1% and physical damage rates by 33.3%.

Reason for the hike, Allstate explains, is that owners are using vans for recreational purposes, not business, and they are spending thousands of dollars more for customizing extras such as fancy paint jobs and far-out interiors. "If you scrape the side of a van with a fancy mural painted on it, it's not a $25 retouch job—it's a major $1,000 expense," commented one insurance official.

Some insurance companies also are charging fatter premiums for vans with high-performance engines, similar to the high rates assessed against muscle cars. It's too early to tell if this "penalty" will have the near-killing effect on sales of beefed-up vans that it did on big-engine-sports-car sales in the early 1970s, a spokesman said.

On the bright side, bodily injury insurance rates for vans haven't been hiked because, unlike the poor accident record for high-performance cars, there are no statistics available yet suggesting that vans are involved in more accidents than other passenger cars.

Meanwhile, van sales climbed to a record half-million-plus units in 1976—nearly one out of every five trucks sold—and U.S. auto makers were frantically adding production capacity at year's end in anticipation of an even greater demand through 1977.

aren't particular about looking both ways before crossing the street. Rounding a curve at 50 miles per hour and coming face to face with a raccoon sitting in the middle of the highway can be a shock to the city slicker! Slow down and blow your horn to scare the animal off the road. Above all, don't jerk the wheel suddenly and try to steer around it.

A word of caution about wild animals: Don't get out of your car to pet them. No matter how cute and cuddly he might look, a wild animal can be dangerous. At best, you're liable to wind up with some scratches requiring antiseptic and bandages. But many wild creatures are also carriers of rabies and other infectious diseases. In the case of larger animals, that warning goes double. Alligators are a special hazard. These ancient reptiles are misleading with their sluggish appearance and their love for lying motionless in or near shallow bodies of water, often just inches away from the roadway. An alligator can travel at speeds of up to 40 miles per hour over land. Every year, hundreds of people in Florida are injured in encounters with gators.

Out of your car, watch your step. Don't go into unfamiliar areas without an experienced local guide. Florida leads the U.S. in dangerous or infectious insects, plants and animals. Be especially watchful for snakes. The two most dangerous are the moccasin and the coral, but don't take chances. Give them all a wide berth. The safest place to see snakes up close is Sarasota's Jungle Gardens.

Even on the golf course, caution is the word of the day. Signs on Eglin Air Force Base's golf course caution "Beware of Alligators." Eglin golfers who hit water hazards take the penalty strokes, as far from the hazard as the rules of the game will allow.

Now that you know what to look for, let's take a little trip through the Sunshine State.

Your itinerary might differ from mine, depending on where you start from and what your special interests are, but here are some ideas.

Entering Florida from the north, near Jacksonville, the thing that impresses you first is the relative flatness of the terrain. Florida was formed millions of years ago

continued

by stages of high and low water, so changes of elevation throughout the state are slight. Lush vegetation lines both sides of the highway and numerous rivers and streams crisscross the countryside.

Continuing south from Jacksonville, less than two hours drive away is St. Augustine, the nation's oldest city. Here, daily pageants and museums relive this country's Spanish heritage and the exploits of the explorers from the days of Hernando de Soto and the other intrepid adventurers who helped open the new world. Farther south is the John F. Kennedy Space Center, featuring the exploits of a more contemporary set of explorers.

After a visit to the space exhibits at Cape Kennedy, or Cape Canaveral as it is again called, we retrace our route to Daytona Beach to pick up Interstate 4 which cuts across the center of the peninsula. About an hour's drive from Daytona is Orlando where one can visit Walt Disney World and Florida's Sea World. To make the most of your visit to Disney World, stop in at your base Service Club before departing your home station and enquire about the special discount card for servicemen.

Next stop after Orlando is the Tampa Bay area. The site of MacDill Air Force Base, this area offers the tourist a lot. Among the most popular attractions is Busch Gardens, a tropical-style amusement park run by the Busch family of brewers. It's hard to tell whether the biggest hit at Busch Gardens is the African motif of the garden itself, or the tour of the Busch Brewery, which includes free samples of their product. (Watch those free samples if you're planning to drive later!) Busch Gardens is located in the northern part of Tampa and has ample parking for driving tourists, as well as special buses from different areas of the city.

Across the bay in St. Petersburg are the famous Sunken Gardens, built over the site of an ancient lake, and the MGM exhibit of HMS Bounty, the ship used in the movie.

If you delight in swimming at beautiful beaches, the best place for you is along the Gulf Coast in Florida's panhandle. On the way, via highways 19 and 98, I suggest side trips to Silver Springs near Ocala for a glass-bottomed boat ride, and Weeki Wachee on highway 19 to see the famous mermaid show.

The Gulf Coast beaches between Apalachicola and Pensacola are the most beautiful in the world. White sand, with the consistency of powdered sugar, looks like freshly fallen snow, and while it cannot compete with the surf of Hawaii and the West Coast, the Gulf of Mexico provides sufficient challenge for the novice or casual surfer.

While you enjoy the beaches, pay attention to the warning signs concerning picking of sea oats and treatment of the dunes. Florida law prohibits picking of the picturesque sea oats because they help to prevent erosion of the sandy

continued

If you combine the hazards of a foggy day and a drawbridge, what do you get? Trouble with a capitol T. As you near the bridge, you peer through the fog and notice that it's up . . . you also now notice that trying to get stopped on dewy, perforated metal isn't easy!

continued

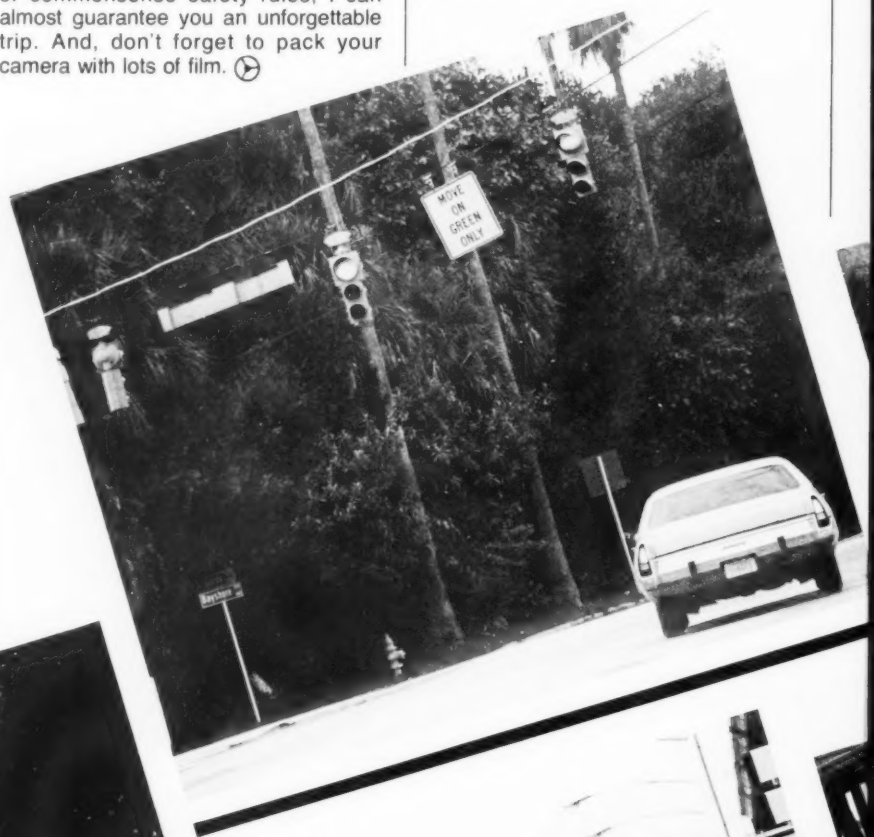
coast. Certain areas of the dunes are restricted to foot traffic in order to prevent damage to the dunes which serve as windbreaks and also protect the natural beauty of the area. The Gulf Islands National Seashore, between Navarre and Pensacola, offers stretches of quiet beach for private swimming and picnics.

From Pensacola to Jacksonville one takes Interstate 10, stopping at White Springs for a visit to the Stephen Foster Memorial and a ride 'way down upon the Suwannee River.

Leaving Florida is like saying farewell to a dear friend. The beauties of Florida would take a lifetime to see and enjoy, and more space than this magazine to list. I hope I've whetted your appetite though, so maybe next year I'll see you there.

Break out your roadmaps, get your car thoroughly checked, and pack a list of commonsense safety rules; I can almost guarantee you an unforgettable trip. And, don't forget to pack your camera with lots of film.

Intersections where a right turn on red is not permitted are usually well marked. Florida's system of lights may be a little confusing to newcomers though. The lights go from green to green and yellow, indicating that the red is about to come on.



Those beautiful Florida bushes and trees obscure more than intersecting roads . . . they can also do a number on street and traffic control signs.

Driving in Tampa isn't so different from driving in New York City. Florida may not have the problems with taxi cabs that New York does, but they do have a unique problem with retirees. The older folks are not, as a group, the most alert drivers in the world, and when you couple that with the fact that many of them are unfamiliar with local traffic conditions, you can really see some interesting lane changes.

SOME OF florida's attractions

East Coast

LION COUNTRY SAFARI—In West Palm Beach, you can drive your car along miles of jungle trails and see hundreds of African animals roaming free in their natural habitat.

MUSEUM OF SUNKEN TREASURE—South of Kennedy Space Center on Highway A1A. A Spanish treasure of $20 million in gold and silver, 1,000 men and 12 ships were lost in a hurricane in 1715. Here, you can see the treasure and hear the story of divers who recovered it.

PARROT JUNGLE—11 miles south of Miami, colorful Macaws fly free, eat from your hand and pose on your arm for pictures.

Central Florida

CYPRESS GARDENS—On Highway 540, southeast of Winter Haven, this attraction features flowers and plants from all over the world.

GATORLAND ZOO—One of the world's largest alligator farms, on the Miami Turnpike south of Orlando. Thousands of alligators and crocodiles, and other animals from all parts of the world.

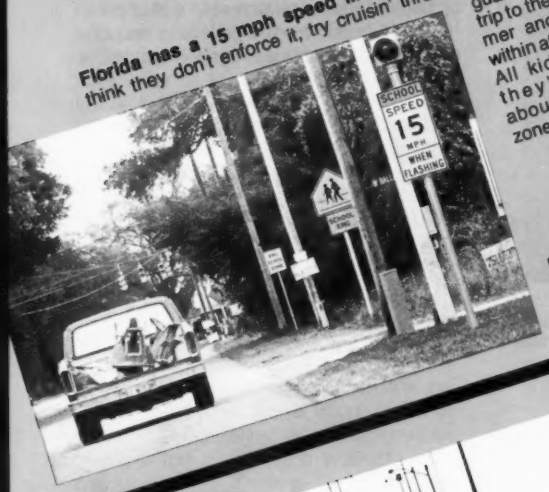
West Coast

SIX GUN TERRITORY—A complete western town of the late 1800s. Features realistic gunfights, saloon shows and authentic Indian dancing. On Highway 40, east of Ocala.

MASTERPIECE GARDENS—On Highway 17A near Lake Wales. "Last Supper" mosaic show in six languages. Features a skyride over 110 acres of formal garden.

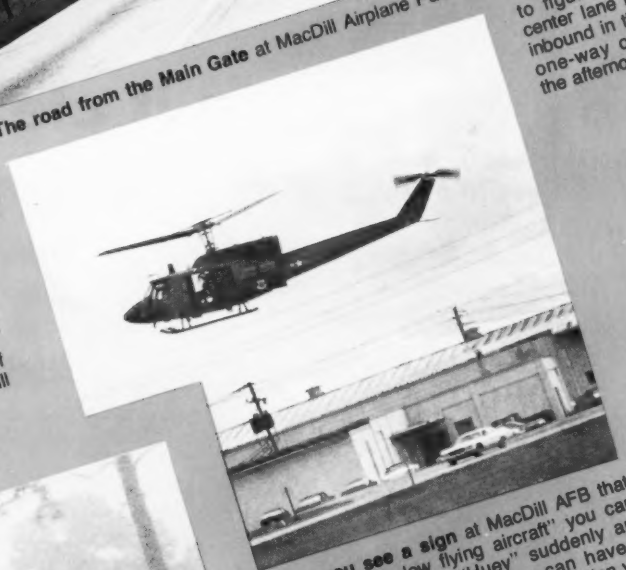
For more detailed information about sights to see in Florida, write the Florida Attractions Assoc., P.O. Box 10116, Tallahassee, Florida 32303, for a full color map and brochure showing the main attractions of the state.

Florida has a 15 mph speed limit in school zones, and if you think they don't enforce it, try cruisin' through one at 20. You are guaranteed a quick trip to the local slammer and a hearing within at least a year. All kidding aside, they're *serious* about their school zones, folks.



The road from the Main Gate at MacDill Airplane Patch can be confusing to a newcomer. It takes a while to figure out that the center lane is one-way inbound in the AM and one-way outbound in the afternoon.

In Florida, this is what passes for a hill! Imagine coming over one of these bridges only to find a stalled car in your lane on the downhill side . . . it's guaranteed to increase your pucker factor to seven.



When you see a sign at MacDill AFB that says "Caution, low flying aircraft" you can believe it! Having a "Huey" suddenly appear, 20 feet over your car, can have a definite effect on the amount of attention you pay to the road. They also make enough noise to give you simultaneous ear and heart failure.

Yes, folks, there *are* days in Florida when the sun doesn't shine! And on these days, there's just liable to be more than a little fog. In the picture above, there is a car with no lights parked directly opposite the oncoming car with lights. Does this give you anything to think about?

"Damn! That burns!"

Ever burn yourself while working on a car, truck, or motorcycle? It's easy to do and generally results from ordinary carelessness.

Most backyard mechanics burn themselves when their skin comes in contact with a hot radiator, exhaust manifold, spark plug, oil filter, oil drain plug, heater hose, front wheel bearing, brake drum, disc brake rotor, muffler, tailpipe, or flaming fuel. You can also suffer painful scald burns from a belching radiator or ruptured water hose, or chemical burns from battery acid.

We're not going to lecture on how to prevent these every-day injuries—that's up to you—but we would like to share some modern ideas on how to treat common burns. Unless you've kept up to date through a Red Cross, Scout-

Chemicals in an eye can cause blindness or acute damage if you don't react super-fast. Quickly flushing the eye from the inner corner outward with lots of water is demonstrated by AF Sgt Rod Miyamoto of Honolulu, HI. Then get to a doctor as rapidly as possible.

Keep it clean and cool, man!

HOW TO TREAT A

BURN

ing, or some such first aid course, you may not know the latest poop.

Webster says a burn is an injury that results from heat, chemical agents, or radiation and is usually classified by depth or degree. Doctors now refer to first- and second-degree injuries as partial-thickness burns and to third-degree injuries as full-thickness burns.

First-degree burns normally cause redness or discoloration, mild swelling, and pain. Healing occurs rapidly.

Second-degree burns usually penetrate external layers of the skin, appear red or mottled, and almost always cause blisters. There is considerable swelling for several days, and the pain can be worse than in third-degree burns.

Third-degree burns involve deeper destruction, usually full-thickness of the skin, and may look white or charred or at first may resemble a second-degree burn.

Medical Help Usually Necessary. Burns from automotive equipment can be first-, second-, or third-degree or a combination of all three. Depending on the extent and location of the injury, second- and third-degree burns usually require medical assistance and possibly hospitalization. In general, an adult who suffers burns over 15% of his body surface requires hospitalization.

The objectives of first aid for burns are to (1) relieve the pain, (2) prevent contamination, and (3) treat for shock. OK, let's put on our memory caps and store away the following information from the American National Red Cross for a "Damn!! That burns!" day.

Heat or Thermal Burns. The name of the game is "Cool it!" As quickly as possible after a first-or second-degree burn, submerge the burned area in cold (not ice) water or run cold water over it. Grab a garden hose or jump in a shower if necessary. Cold water is the best way to halt the destruction of skin tissue. Just as a beef roast continues to cook inside after the oven is turned off, so the underlying layers of your skin will continue to cook unless cooled immediately.

continued

Heads-up action following an accidental burn usually will reduce both the severity of the wound and its healing period. Working on this '73 Plymouth Satellite Sebring, SrAmn Don Campion of Tacoma, WA simulates burning his left arm on the engine's hot manifold (Photo 1). Grabbing a nearby garden hose (Photo 2), he quickly starts cooling the burned area with a heavy stream of water, while a buddy runs for some clean bed linen and ice water. After wringing out a pillowcase in the ice water (Photo 3), SrAmn Floyd Sturdevant of Milwaukee wraps it around Campion's arm to further cool the burn and protect it from germs. Next stop: A doctor's office or hospital.

Let it cool for at least 10 minutes if it's a minor or first-degree burn; medical treatment usually isn't necessary.

Butter, oil, commercial antiseptic burn ointments and sprays, and home remedies are no longer recommended for first aid treatment of burns. A doctor will have to remove these applications before he can treat the burn, and removal can be a slow, painful, and possibly damaging process. The gunk may also slow or prevent the cooling action.

If it's a second-degree burn, immerse it in cold water, or for one to two hours apply a freshly ironed or laundered cloth such as a sheet, pillow case, or linen table cloth that has been wrung out in ice water. Never add salt to ice water; it lowers the temperature and may produce further injury.

Germs Love Burns. After it's cooled, gently blot the burned area dry with sterile gauze or the cleanest available cloth, towel, or other household linen

(above)
Professional medical help is required for most second and third degree burns. SrAmn Dora Partidge, right, simulating a minor burn on her right forearm, has the injury treated by her fellow medical technician, Amn 1/c Pauline Barbour at the Norton AFB, CA Clinic. From left to right, Barbour cleanses the burned area with a saline solution and PhysoHex, an antiseptic lotion; gently dresses the wound with Silvadene cream, a drying and healing agent; bandages it protectively with sterile gauze.

how to treat a burn

continued

and then cover it with a dry, sterile gauze or cloth protective dressing. The idea is to keep the burned area as free of germs as humanly possible. Do not use absorbent cotton or any material that will easily adhere to the wound. Do not try to break blisters or remove shreds of tissue. Blisters serve as a sterile dressing and can quickly become infected if broken.

First aid for extensive second-degree burns is the same as for third-degree burns. Do not remove adhered particles of charred clothing. A cold pack may be applied to a burned face or to burned hands or feet, but do not immerse the burned parts in ice water or apply ice water over an extensive burned area. The cold may only intensify the shock to the nerve system.

If a clean cloth is unavailable, take an unused plastic garment bag and tie it or tape it over the burned area or insert your entire arm or leg into it then secure it. Never put plastic over your head.

Don't Be Proud, Get Help! If your hands are burned, keep them higher than your heart. Hold them in a vertical position or support them on pillows if you're lying down. Burned feet or legs should also be elevated, and you should not do any walking if someone is available to carry you. Exerting or applying pressure to any burned area only prolongs the healing period.

Call for an ambulance to take you to a hospital as quickly as possible. Don't underestimate the severity of your burn—the true damage may not become apparent until the second or third day following your accident. If an ambulance is not available, have someone drive you to medical help.

The pain will probably be intense, but don't try to kill it by downing a shot or two of whiskey or other alcoholic beverage. If it will take an hour or more to reach medical help and you're not vomiting, take a weak solution of salt and baking soda at home or en route (1 level teaspoonful of salt and ½ teaspoonful of soda to a quart of water, neither hot nor cold). Sip about 4 ounces (a half-glass) slowly over a period of 15 minutes. Discontinue drinking if vomiting occurs. Aspirin or other home medication may be taken for pain.

If you burn a finger on which you are wearing a ring, remove it immediately. It may swell so much that the ring will have to be cut off. The same applies to a wrist watch, bracelet, and other jewelry.

First Aid for Scalds. If a radiator or hot water hose suddenly spurts boiling water on you, cool the burned area at once by showering or immersing it in cold water. If your clothes are soaked and not stuck to the skin, remove them—cut them off if necessary. Then treat the damaged area as a heat burn.

Chemical Burns. Chemical burns are the same as those caused by flame, steam, or hot liquids and should be treated instantly to prevent further damage. Acids such as the sulphuric acid

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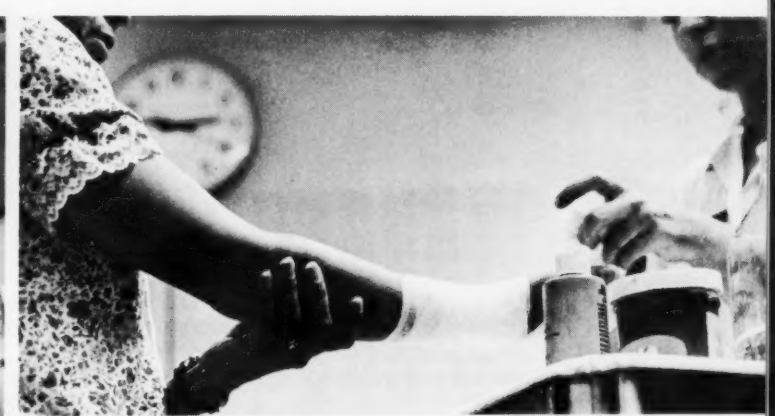

Dumping a motorcycle may not hurt the bike but it can surely cause a serious burn if your body comes in contact with a red-hot exhaust pipe as simulated by this rider. Momentarily pinned under his Honda when it jumped a curb, Amn 1/c Ken Schultz of Milwaukee grimaces with pain as he holds his badly seared right leg. Speedy first aid and followup treatment by a physician are essential here to minimize effects of the injury.

how to treat a burn

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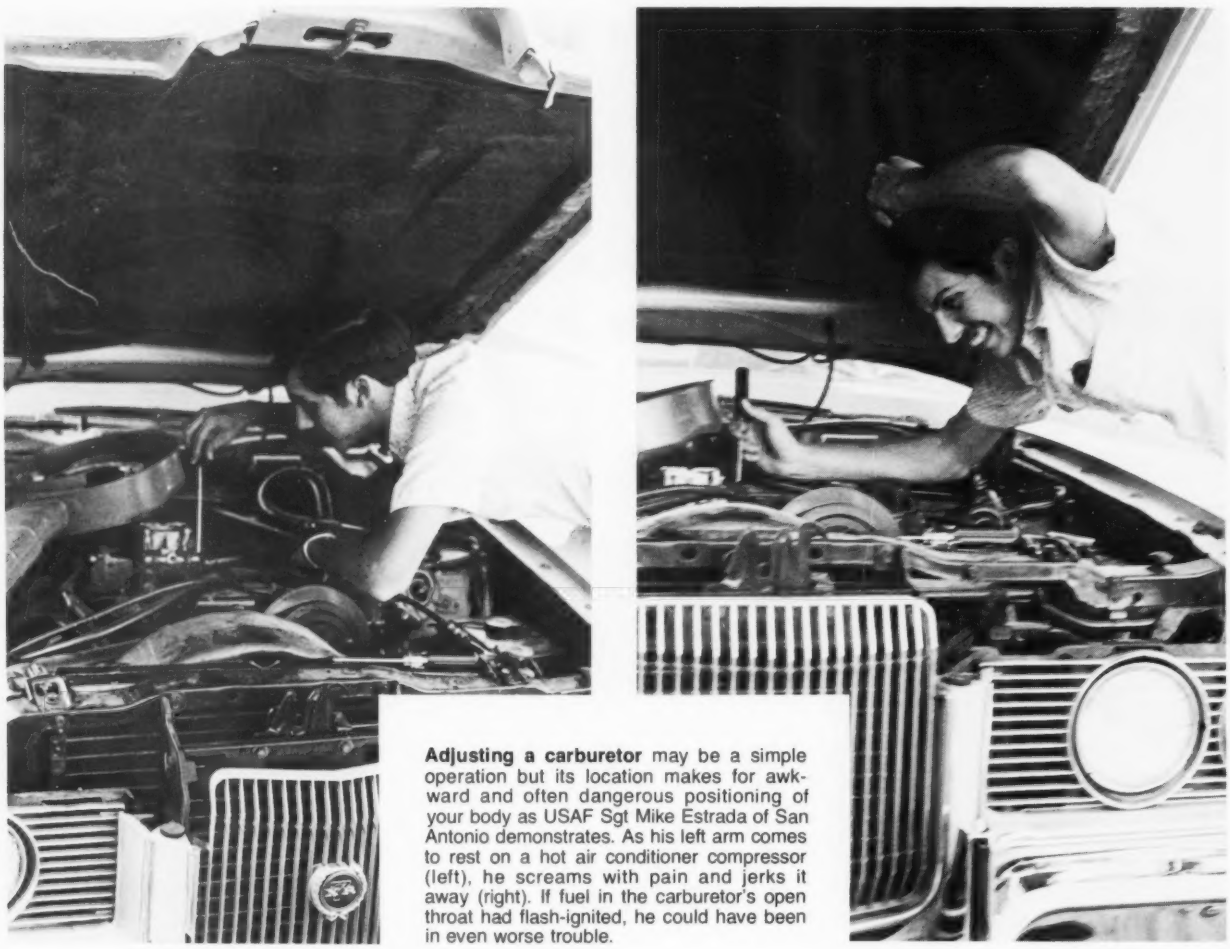


Adjusting a carburetor may be a simple operation but its location makes for awkward and often dangerous positioning of your body as USAF Sgt Mike Estrada of San Antonio demonstrates. As his left arm comes to rest on a hot air conditioner compressor (left), he screams with pain and jerks it away (right). If fuel in the carburetor's open throat had flash-ignited, he could have been in even worse trouble.

in your auto's battery or alkalis such as lye and caustic soda all are corrosive and will quickly eat into your skin or any membrane area.

Run—don't walk—to the nearest tap, hydrant, or shower. Flood the affected area with large amounts of water to dilute the acid or alkali and continue washing—at least 10 minutes—until all of the chemical is removed. Treat the burn as a heat burn, apply a dry sterile padded dressing, and get yourself to a hospital without delay.

How About Your Eyes? Should you suffer a chemical burn in an eye, the two most important things to do are (1) wash it immediately and copiously with water and (2) get to a doctor as rapidly as possible. Every second counts here if you are to avoid either partial or total blindness.

If your eye is burned by acid, turn your head sideways, hold the eyelid open, and flush water freely from the inner corner of the eye outward. If you can't depart immediately for medical assistance, quickly make a weak baking soda solution (1 teaspoon per quart of water), but use it only after first washing your eye with tap water. Take aspirin for pain if necessary and then, if possible, telephone a doctor for further advice.

If your eye-burn is from an alkali such as strong laundry or dishwasher detergent, used by many people to wash their cars, repeat the first aid described for an acid burn with the following exceptions:

After rapidly washing your face, eyelid, and eye area with tap water, hold the lid open and continue heavy irrigation for at least 15 minutes. Remove any dry chemical particles from the eye as soon as possible by gently lifting them off with sterile gauze or a clean handkerchief. Do not use a soda solution for alkali burns; instead, if you're going to be delayed in getting to a physician, use a weak solution of vinegar and water as a final rinse. Then call the doctor for additional directions.

Between acid and alkali, alkali burns are the worst. Acid tends to neutralize itself as it penetrates tissue, but alkali just burns deeper and deeper. Treatment by an opthalmologist is almost always necessary for alkali burns.

Burns represent the second leading cause of accidental deaths in the United States each year, not to mention that they cause untold amounts of pain and suffering for the victims. An ounce of precaution is still worth a pound of cure, but if you or a friend are unlucky enough to be burned working around a vehicle, recall what you've just read. Act fast, play it clean and cool!

I'm Not Stupid But...

by J01 JOEL E. JACOBS, USN
Bellevue, WA

"Damn it, damn it, damn it, damn it!," I screamed as the rolling tent trailer shoved me faster and faster down the hill. Suddenly the 800-pound monster slammed into me and I grimaced in pain.

Fortunately, either fast thinking, reactions, luck or a guiding hand turned me to the side and I fell into the soft dirt on a hillside instead of landing on the gravel and rock-strewn road. Luckily, I had managed to hang on to the trailer tongue instead of falling in front of it and having it impale me.

"Barbara!," I yelled. "I'm in trouble!"

My wife was around the trailer and at my side almost immediately.

Seeing or perhaps sensing the question in her eyes, I responded almost automatically, "No, I'm not hurt. At least not bad, I don't think."

The groundwork for this accident had been laid weeks before it happened; with some forethought, a little planning and the use of common sense it never would have happened.

My family and I do a lot of hunting, fishing, riding around, and sightseeing. We do so much in fact that motel bills and gasoline expenses were taking a major portion of our recreation money. We decided to buy a trailer.

Where the troubles started was that after buying the travel trailer we didn't take the time to get acquainted with it. We didn't hook it up and tow it around the block, practice backing it up, or do any of the things that we knew we should have done. We didn't even practice putting it up and taking it down. *(Read "Happiness Is Year-Round RVing," DRIVER, Aug. 1976)*

It was opening weekend of the hunting season and we were excited about our first outing.

I awakened early and listened to the weather report for conditions in eastern Washington. The forecast east of the Cascades was for possible showers and high winds. I listened to the word "possible" and ignored the rest.

We packed food, stove, lantern, water, guns, ammunition, sleeping bags—the works. I put on my tennis shoes and we took off.

Three hours later we turned off Interstate 90 onto a side road at the town of Vantage and then went to an area known as the Colockum. This is several thousand acres of rocks, sage brush, cliffs, canyons, little water, and more than its share of rattlesnakes. But the birds love it.

The wind was blowing moderately hard when we arrived and I wanted to set up camp immediately, but my wife urged me to try for a more protected location.

Against my better judgment we continued on the dirt road and started up a rocky hill. The grade proved to be steeper than I had anticipated and we slowed, then slowed some more. The wheels began to spin in the soft dirt and I could go no further. I slipped the transmission into reverse, started backing up and immediately jackknifed the trailer.

Now I couldn't go up or down.

"No problem," I thought. "Just unhitch the trailer, turn it around, turn the car around, hitch the trailer up, and go on my way."

I unhooked the trailer. I held on to the tongue and slowly turned the trailer around. As soon as it was pointed downhill the weight shifted and I slipped—the damned tennis shoes couldn't get traction in the sand, rocks, and gravel. That's when I started my marathon run in front of the trailer, holding frantically on to the trailer tongue and cursing until the trailer and I slammed into the soft dirt on the side of the hill.

Our immediate problem was how to get the trailer tongue, with its shifted weight, off of me!

We did manage to raise the tongue. I moved into a position to raise the trailer up enough for Barbara to put down first the front and then the rear trailer supports. The short-lived daytime-nightmare was over.

After we got the trailer off me, I turned the car around, hooked the trailer up and slowly made our way down the hill. We found a level spot, the place where I had wanted to stop originally, and we started to set up the trailer.

We had more fun almost immediately. What should have been a simple 10- or 15-minute job took more than an hour and a half.

We pulled, tugged, strained, tried, then tried some more, and finally got camp set up. We ate a cold supper, drank some very welcome hot coffee, and went to bed.

That night, the cold north wind blew and popped the canvas of our trailer. The trailer was rocked and shoved; it groaned and creaked. And combined with my bruises from the trailer fiasco of the early afternoon, the noises kept me from sleeping. At sunrise I was awake. I was sore, wind blown, and tired.

We ate breakfast, drank coffee, packed up our gear, and started to fold up the trailer. This is another "10- or 15-minute job" that turned into more than an hour.

Exhausted, sore, and slightly less than happy, I knew that we should go home, but we didn't. Instead, we ran up and down sagebrush-covered hills searching for birds.

We couldn't find the crafty birds. Instead, we got more wind-blown, more sand-stung, and more tired. My wife felt almost as bad as I though obviously not as sore . . . she didn't have a trailer try to smack her.

Wearily we finally got the car back on the road and started toward home. I made it just past Snoqualmie Pass before I ran completely out of energy and Barbara had to drive the remaining 60 miles home.

After a steaming hot shower, a shave, a drink, and three aspirins, I went to bed and slept marvelously for more than 12 hours.

We didn't get any game but we did get much smarter. Consider all the mistakes we made.

Our first obviously was not taking the time to become knowledgeable about our trailer. I am a journalist and photographer, a shooter and hunter, and I wouldn't dream of taking a new camera on a photo assignment without running a couple of rolls of film through it; nor would I take a firearm on a hunting trip without first firing it on a range.

But I took my trailer out without learning anything about it. We should have taken it to a parking lot somewhere and learned how to handle the thing. We should have practiced backing up, and we should have determined just how much of a grade the car would handle with the increased load.

Also, we should have practiced, practiced, practiced putting the trailer up and taking it down. The job is not complicated, but we made it complicated through ignorance.

My next mistake was wearing improper footwear. I knew that we were going into sandy, rocky, gravel-covered country. Tennis shoes are not proper footwear for this type of terrain. I own three pairs of lug-sole hunting boots, one of which I ultimately wore hunting—why wasn't I wearing them when I started my journey down the hill?

Third and not the least, I ignored the weather report—that was just plain stupid, as were all the other mistakes.

Fortunately, through it all, no one was hurt. We learned a lot and will certainly be more cautious in the future. I in particular will think things out in more detail because after all, I'm not stupid . . .

FIXUP FOR SAFETY

by
Capt RICHARD L. SUTLIFFE
Detachment 7, 14th
Weather Squadron
Mather AFB, CA

Photos by
TSgt JORG NIEMI

By nature the two-wheeled vehicle is not as forgiving of operator inexperience as the automobile and lack of knowledge can prove fatal.

For example, it's common to remove the gas tank when working on hidden wiring, rebuilding the engine, or repainting the tank itself. The removal and reinstallation is fairly simple and can be done by most operators. But the throttle cable, which rests under the tank, must be replaced exactly as it was or it may not have enough slack. If the cable is incorrectly installed (and this is very easy to do) the lack of "play" can cause the motorcycle to speed up when turning a corner!

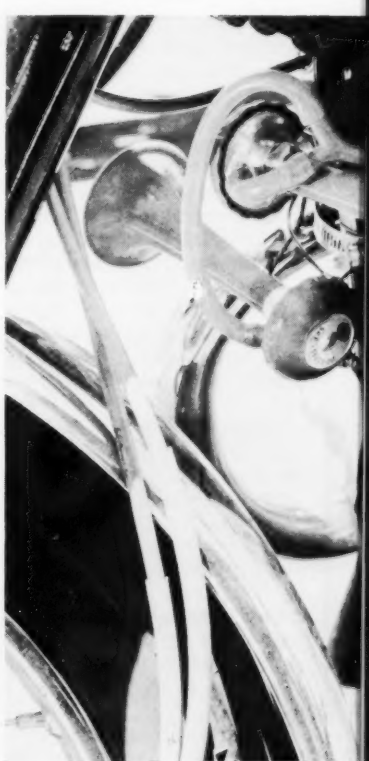
If this is news to you, the following pictures may be of interest. They illustrate some not so obvious two-wheeled hazards and some possible solutions.

Turn Signal Horn—Most motorcycles don't have self-canceling turn signals that disengage after a turn is completed. This makes it very easy to leave the turn signal on long after the turn, misleading and confusing other motorists.

Solution—A turn signal beeper (arrow, note wires) that fits easily onto almost any bike can be bought. The beeper gives an audible reminder to the rider that the turn signal is engaged, and is loud enough to be heard over road noises. It also serves as an audible warning to pedestrians and other motorists of the biker's intention to turn. Installation of a turn signal beeper takes about 30 minutes.

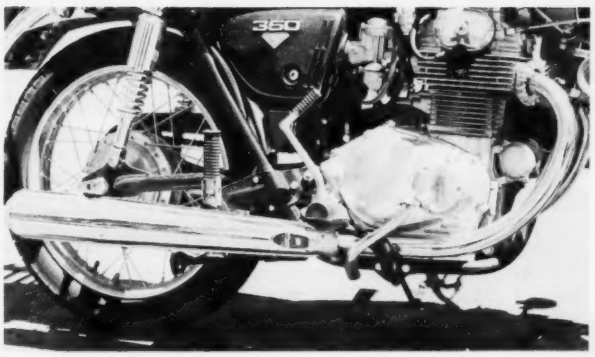
Horns—Almost as important as being seen is being heard. The horns on even large motorcycles are not very loud; when approaching an intersection it's often desirable for cyclists to announce their presence. (Motorists tend not to "see" two-wheel vehicles.)

Solution—There are air horns on the market (arrow points to air compressor) that loudly announce the cyclist's presence. The horns are expensive, but well worth the money. Installation time is about one hour.



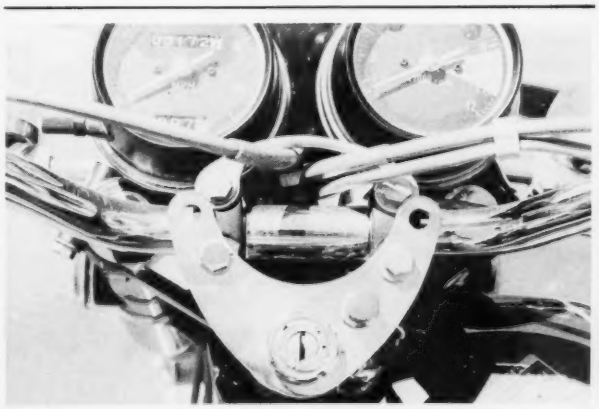
Gas Cap—Many gas caps open forward. Serious groin injuries can occur even in low speed collisions if the cap is not secured properly.

Solution—Make sure the cap is secure before starting out. There is a locking device that can be bought for extra safety and security.



Exhaust System—The low profile of these exhaust pipes identifies this as a street bike (trail or dirt bikes have higher pipes to protect them in rough terrain). Street bike exhaust systems generally don't have flame and spark suppressors; this presents a very real danger in grassy areas. In especially dry areas, even dirt bikes equipped with suppressors should not be used.

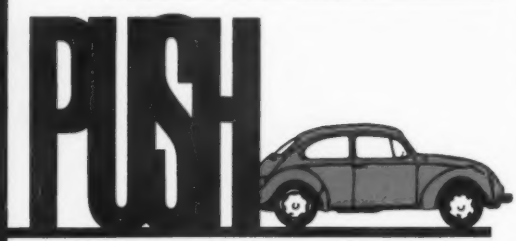
Ignition Switch Problem—Many ignition switch brackets are located under the gas tank (arrow). This causes several unsafe conditions. For instance, the driver must bend down to reach the switch, often tilting the bike and creating a tipping hazard. Also, the switch is close to hot engine parts (exhaust pipes, cylinder heads), which could cause serious burns.



Ignition Switch Solution—A boomerang-shaped bracket can be purchased and used to mount the ignition switch to the handlebars. (The above bracket was designed for a 750cc bike so new bolt holes had to be drilled to accommodate this 350cc bike.) Installation time is about one hour.

Knowing

y



More than one of every five cars in the United States experiencing a breakdown of some kind have to be towed or hauled away. And there's no count available on how many have to be pushed to get started again.

The American Automobile Association (AAA) alone says it services about 85 million passenger car breakdowns a year of which about 18 million are tow-jobs. With these kinds of odds going against you, knowing something about pushin' or pullin' your particular model auto may prove useful, especially during winter months. More roadside emergencies occur in cold and downright nasty weather than during any other period of the year.

This article won't tell you how to trouble-shoot or correct a breakdown but will describe some precautionary measures to take when you do have one. Many emergencies simply involve being stuck in snow, ice, or mud. These can be a bear but, mechanically speaking, they can usually be handled with the least amount of trouble to you. If you can't get your vehicle's engine started, however, you may innocently compound both the problem and potential expense in the pushing or pulling process.

Let's talk first about pushing a car. To keep from confusing you, we will confine our facts to American-made autos but don't stop reading now. Much of what we say also applies to foreign imports.

Some Facts About Pushing. Pushing once was an accepted method for starting a car. Today, however, it shouldn't be done except as a last resort. In fact, it isn't even possible to push-start most 1965 and newer model U.S. cars with automatic transmissions (see chart on page 16). That's because they use only ONE transmission pump to supply the necessary hydraulic line pressure needed to operate the clutch and band pistons (Fig. 1).

The pump rotates with the input shaft and is turned by engine torque. If the engine doesn't run, there's no hydraulic pressure developed to apply the clutches that couple the input shaft to the output shaft to drive the rear wheels (Fig. 2).

Conversely, if the car is pushed and the rear wheels are driving the output shaft, there's no oil pressure to couple the output shaft to the input shaft and turn the engine. So not only will the engine not turn over, but the transmission may also be damaged because of the lack of oil pressure to adequately lubricate its operating parts should the car be pushed too fast or too long. For these reasons, pushing is not recommended and specific restrictions also exist when cars are towed.

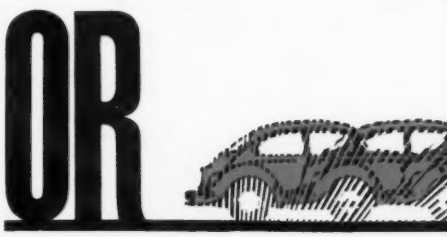
Most 1964 and earlier model U.S.-built cars with an automatic transmission have a front AND rear pump (Fig. 3). They can be started by pushing as—of course—can all cars having manual transmissions (stick shifts).

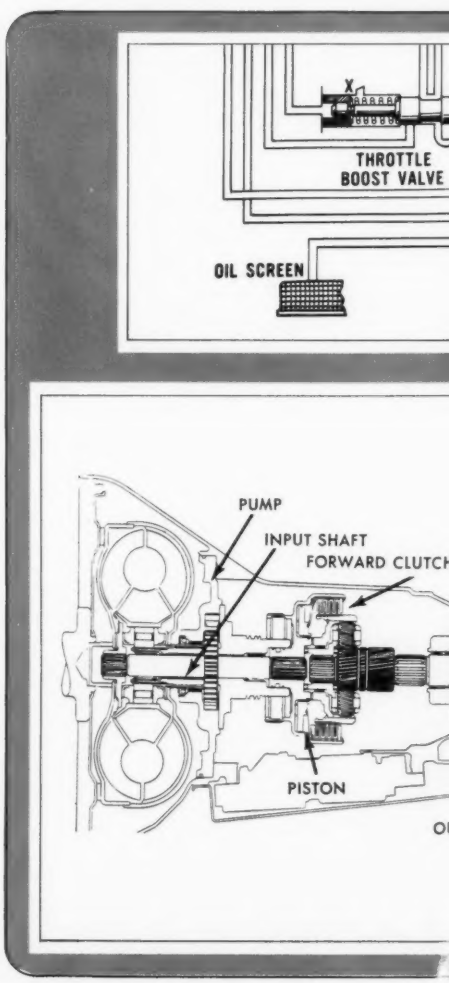
Push Without Power Dangerous. If your vehicle is equipped with power steering or power brakes and it is absolutely necessary to have it pushed, be aware if you're the driver—or advise whoever is—that there will be no power assistance until the engine starts. This is particularly important if you're not too husky because you may have to use both feet on the brake pedal and grip the steering wheel with both hands and a prayer to turn it adequately.

Another good reason for not pushing a vehicle is the difference in the height or configuration of front and rear bumpers on most cars, especially those built before the government standardized bumper shock and guard systems in 1973. If the bumpers don't protrude into the front grille, hood, rear trunk area, head- or tail-lights, or fenders, then you can probably push or be pushed without too much danger of wrecking your car.

Perhaps the best reason for not pushing a car is that it is plainly dangerous and in many states is illegal except to remove it from traffic lanes to the roadway shoulder or nearest other safe parking place. It's also illegal to be pushed or towed in many states except by professional tow trucks or authorized emergency vehicles. To be caught doing it yourself in these states will subject you to a traffic citation and possible court fine.

Automatic Transmissions Vary. As indicated in our chart, many automatic transmission-equipped cars cannot be started by pushing because of the ab-





ng if and how your car can be pushed or towed may save you time, headaches, unnecessary repair bills. And maybe an accident.

sence of a rear oil pump. If the battery will not crank the engine, a fully charged battery should be installed or jumper cables used from another charged battery. (See DRIVER, Mar '76)

Alternator-equipped cars cannot be push-started when the battery is completely dead because, unlike a generator, there is no residual magnetism in the rotor (which corresponds to the field coils in a generator).

When using jumper cables on alternator-equipped cars, be sure to connect positive to positive and negative to nega-

continued

PULL?

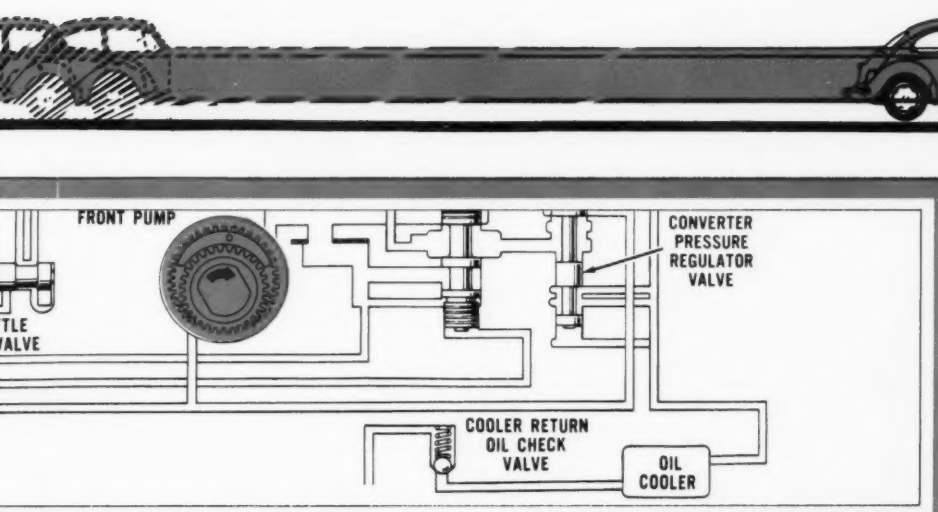


Fig. 1 (left)
Typical hydraulic circuitry of a conventional automatic transmission showing only the one front pump, found on most American-made autos from 1965 to '77.

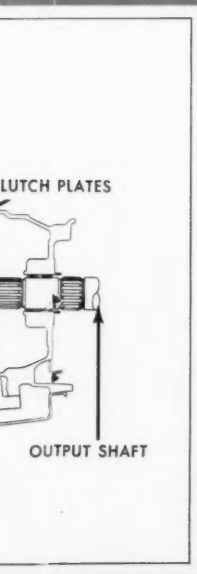


Fig. 2 (left)
Cross-section view shows the pump operation necessary to couple the input and output shafts together in an automatic transmission.

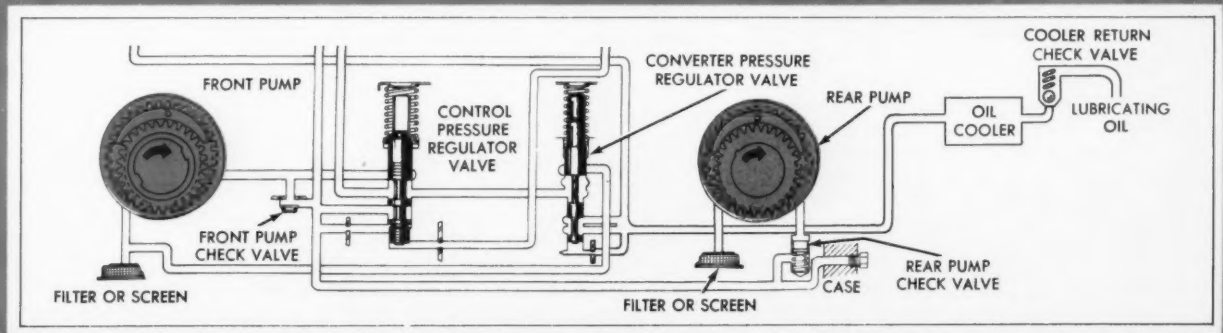
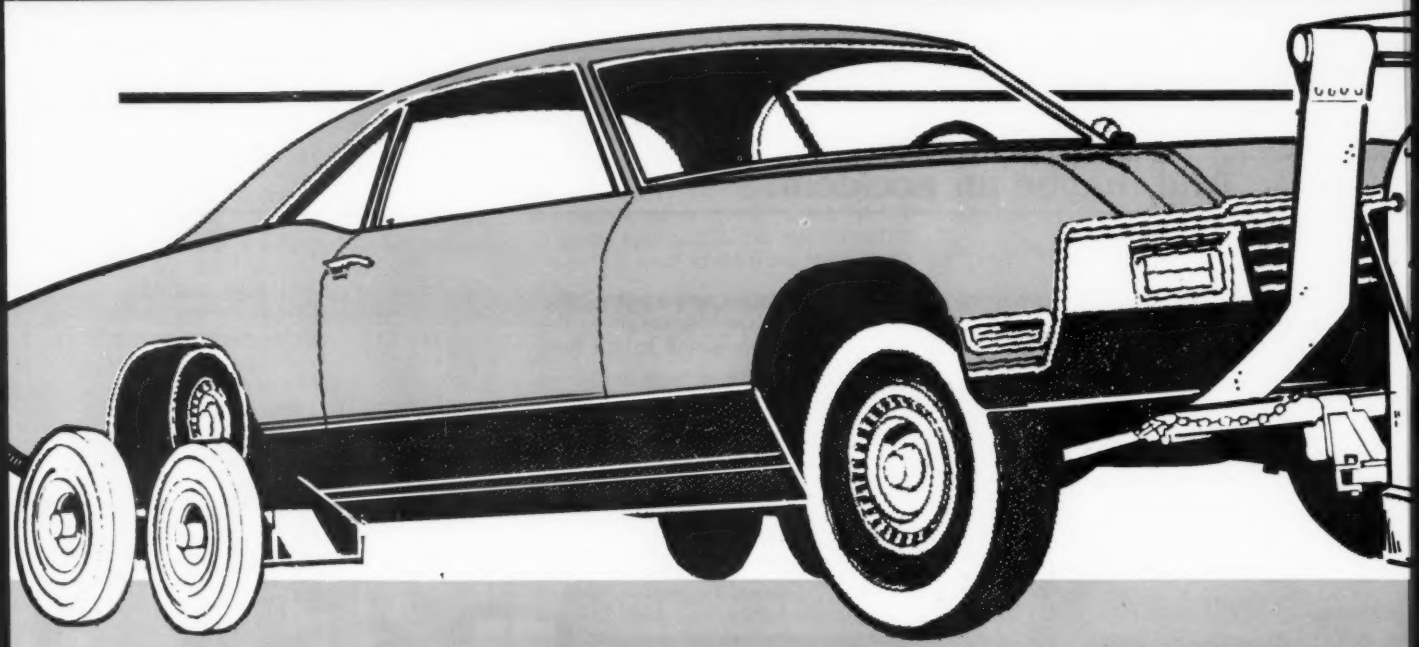


Fig. 3 (above)
Typical hydraulic circuitry showing both front and rear pumps for a conventional automatic transmission employed in most American-made autos built before 1965.

Illustrations courtesy of Ford Motor Co.

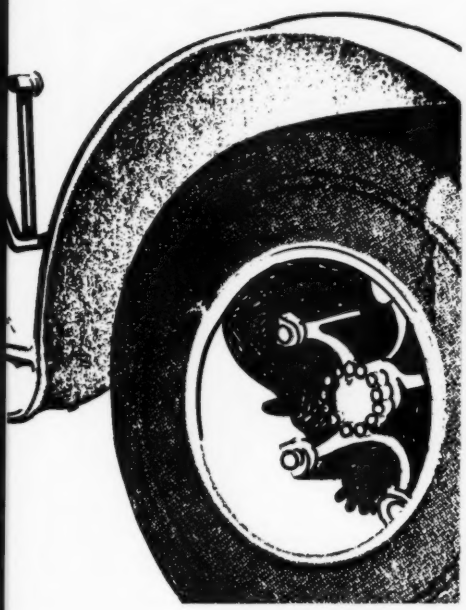


To prevent the rear wheels on this 1969 Buick Riviera from turning and thereby protect its automatic transmission, the tow truck operator uses a dolly. He also employs a sling lift to protect the grille from damage by the truck's towbar.

Car	Transmission	Push Starting				Towing	
		Start Pushing In	Ignition On At M.P.H.	Shift At M.P.H.	Shift To	Hold Speed At or Below M.P.H.	Maximum Distance Miles
American Motors	Flashomatic[9]	Neutral	15-20	15-20	L	40	[1]
	Shift Command	[3]	[3]	[3]	[3]	35	50
	Torque Command	[3]	[3]	[3]	[3]	35	50
Chrysler Corp.	Powerflite	Neutral	0	25	L	35	100
	Torqueflite, Aluminum[8]	Neutral	0	15	L	30	[1]
	Torqueflite, Cast Iron	Neutral	0	15-20	L	35	100
Ford Motor Co.	C3, C4, C6, CW & FMX	[3]	[3]	[3]	[3]	30	15
	3 Speed[10]	Neutral	30	30	L	40	12
	2 Speed	Neutral	25	25	L	30	15
Gen. Mot. Corp.	Buick Dual Path Drive	[3]	[3]	[3]	[3]	25	[1]
	Buick Twin Turbine	Neutral	0	15	L	35[2]	[1]
	Corvair Powerglide	Neutral	0	20-25	L	50	[1]
	Dual Coupling Hydra-Matic	Neutral	30-35[6]	30-35[6]	D[6]	[5]	[1]
	F-85 Hydra-Matic, 1961-63	[3]	[3]	[3]	[3]	30	[1]
	Jetaway Hydra-Matic	[3]	[3]	[3]	[3]	35	[1]
	Roto Hydra-Matic	[3]	[3]	[3]	[3]	30	[1]
	Turbo Hydra-Matic "200," "250," "350" & "375B"	[3]	[3]	[3]	[3]	35	50
	Turbo Hydra-Matic "375," "400" & "425"	[3]	[3]	[3]	[3]	35	50
	Powerglide Aluminum[8]	Neutral	0	25-30	L	35	50
	Powerglide, Cast Iron	Neutral	0	25-30	L	30	[1]
	Super Turbine "300"	[3]	[3]	[3]	[3]	35	50
	Super Turbine "400"	[3]	[3]	[3]	[3]	35	50
	Tempestorque, 1961-63	Neutral	0	20-25[7]	L	30	[1]
	Tempestorque, 1964	[3]	[3]	[3]	[3]	25	[1]
	Turboglide[6]	Neutral	25	25-30	HR or GR	30[4]	[1]
Studebaker	Flightomatic	Neutral	0	20	L	40	[1]

[1] See Towing Precautions in accompanying article.
[2] 25 M.P.H. with air suspension.
[3] Not possible to start by pushing. See Push Starting above.
[4] 10 M.P.H. with air suspension.
[5] Do not tow.
[6] Not possible to push start after 1958.
[7] Not possible to push start after 1962.
[8] Not possible to push start after 1965.
[9] Not possible to push start after 1966.
[10] Not possible to push start after 1967.

Information courtesy of *1977 Motor Manual*



tive to prevent damage to the alternator. Also, hook both cables to the charged or booster battery first to prevent possible explosion.

Is Your Vehicle Towable? If your car's unstartable, it's more likely that you'll need a tow so let's talk about pulling. With today's passenger cars, special precautions and special types of commercial towing equipment are usually needed to bring in a disabled vehicle without damaging its body structure, sheet metal, or bumpers. It will pay you to familiarize yourself with how your particular vehicle should be lifted and/or towed. Visit your base hobby shop or public library and look under "Towing" in a *Mitchell Manual's (MM) Diagnostic Guide, Motor's Auto Repair Manual,* or *Chilton's Auto Repair Manual* of the same year's volume as your vehicle's model year.

Before towing a vehicle, be sure that:

1. The parking brake is off.

2. The transmission operates properly and is in neutral. Check the dipstick (with motor off) to see if the transmission does have fluid in it.

3. The rear axle operates correctly. Did you notice any abnormal sounds in the drive-train before the car stopped?

4. The attaching chain, towbar, or cable for towing your vehicle is not attached to the bumper or bumper bracket. Make certain the hookup is attached to a main structural member of the frame.

Choose Correct Towing Method. If the above conditions are met, the vehicle may be towed with the rear wheels on the ground. Do not exceed the recommended speed limit or travel distance for your car if it has an automatic transmission (see chart).

If the rear axle is damaged or has failed, the rear wheels MUST be raised off the ground and the car towed with the front wheels in the straight-ahead position on the roadway, or the car must be towed with the front wheels resting on a wheeled dolly.

If the transmission is damaged or inoperative, the driveshaft MUST be removed prior to towing the vehicle, or the rear wheels raised or supported on a wheeled dolly as described, whichever is more convenient for the tow vehicle. Either one of these methods should also be used on any car that is to be towed more than 15 miles or faster than 30 mph.

NOTE: To tow a vehicle with both the steering column and transmission locked and no ignition key available, the vehicle may be lifted from the rear with the front wheels locked straight ahead. If the wheels are locked in a turned position, they must then be towed with a dolly under them. If the rear axle is operative, the drive shaft should be disconnected and the vehicle towed with the front wheels off the ground. These procedures apply to all vehicles beginning with 1969 General Motors cars (1970 for other American makes), except Corvair.

If you own a four-wheel drive vehicle such as a Bronco or Jeep, certain precautionary steps must also be taken before towing to avoid damage to the transmission, transfer case, and axles. Again, refer to your vehicle owner's manual or to one of the previously mentioned auto repair books for specific guidance before an emergency occurs.

Safe Towing Tips. Now that you're ready to tow or be towed, let's look at some tips on how to do it safely:

1. Do not ride or allow riders in the car being towed.

2. Do not tow at speeds inconsistent with road, weather, and traffic conditions. In other words, take it easy.

3. If possible, two persons should ride in the tow vehicle. While one is driving, the second can watch the mirrors and keep an eye on the disabled vehicle.

4. If towing a vehicle on its front wheels (rear wheels raised), tie the steering wheel to a window post or otherwise secure it so the wheels will track in a straight-ahead position.

5. Drive carefully when towing cars with a long body overhang to prevent damage to bumpers and sheet metal by scraping. On cars equipped with a front end spoiler, the spoiler must be removed for either front or rear towing.

6. The tow vehicle should always be driven with headlights on, while the vehicle-in-tow should have its parking lights on and its taillights and turn signals hooked up to the tow vehicle's light system.

If There Ain't No Tow Truck? Everything we've said so far is all well and good, especially if an auto club or commercial tow truck is handy, but what about the ordinary, everyday driver like maybe you whose car is equipped with a stick shift or an automatic transmission that permits pushing or pulling? You've been stranded for hours and another motorist finally stops and offers to give you an emergency shove or tow. What do you do now?

Let's start with the easiest method—pushing—easiest, that is, if your bumpers match. Today's car and light truck bumpers were not designed for pushing or towing. As one chrome-plating plant manager told DRIVER, "Most bumpers are flimsy—ornamental only. Some are made of sheet metal or malleable steel rather than spring steel. Bumpers on most foreign cars today are a laugh—they're so thin they can't be straightened. They're just sheet metal."

Aluminum bumpers such as those on 1974 and newer Camaros are the most rugged in use today, we were told. They can't be rechromed to factory specs or straightened with a 10-ton press, but they can be anodized. Most American cars have by law since 1974 been manufactured with reinforcement- or back-bars on both front and rear bumpers to help withstand collisions.

A banged-up bumper costs a bundle to repair or replace today, too. In the 1940s, a good spring-steel bumper ran $8 to $15, new. Today, a new bumper for a 1975 Cadillac prices out at about $450. To straighten and rechrome a 1971 Olds' rear bumper costs about $90 versus $150 for a new one.

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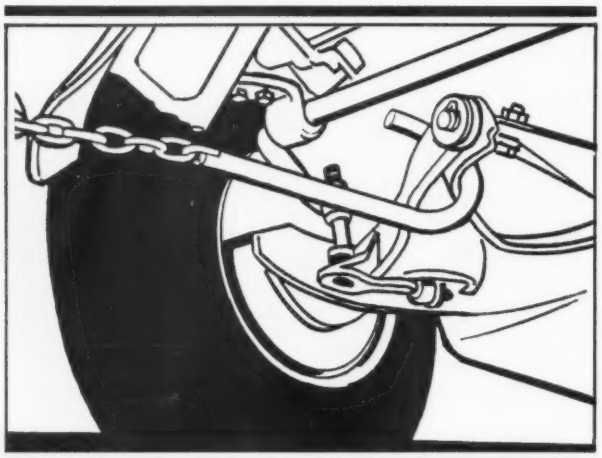
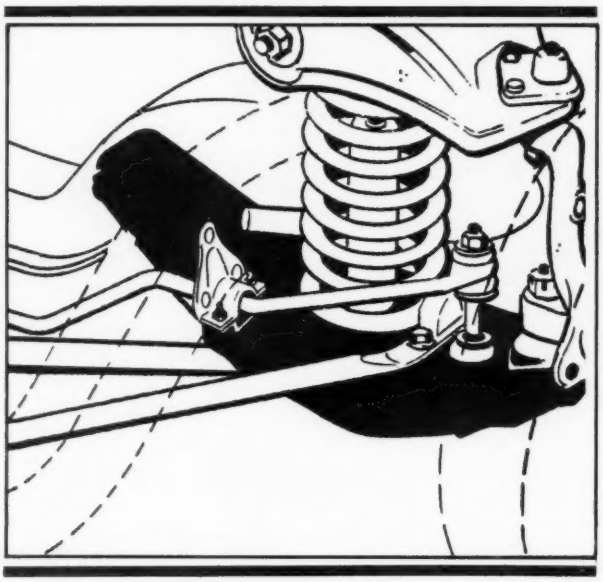




A towing device should never be hooked to an auto's bumper or bumper brackets but to structural members of its frame or undercarriage. Typical examples of hooking points from left to right are the front ends of Chevrolet, Ford, and American Motors cars and the rear of a Chrysler.

Do-It-Yourself Pushing. All set now for a do-it-yourself push job? If necessary, manually push your disabled vehicle into a safe position for the vehicle helping you. Drape an old towel or pad over either one of the contacting bumpers to avoid scarring the chrome and bright metal. Now, in this sequence:

1. Work out a set of simple hand and horn signals between drivers for starting, stopping, slowing down, speeding up, turning, "Danger ahead!", "Ready to let out the clutch!", and any other useful messages you may want to communicate.

2. If you're the front driver, turn on your headlights for safety. Do not stop suddenly or the rear end of your vehicle will rise, and the vehicle behind will probably roll under your bumper. In moving forward, brake very lightly to help get a smooth start then brake only as necessary after first signaling.

3. In three-speed, stick-shift vehicles, if you think the engine will start, shift into second gear before you start rolling and don't release the clutch until you reach about 15 mph, or 30 mph in high gear. For automatic transmissions, shift into "Drive" at about 15 mph.

4. If you're driving the rear car, turn on the parking lights and four-way flashers, start forward gently, and brake to a safe distance behind as the disabled car passes over all dips, gutters, speedbumps, and entrances and exits to off-street driveways, alleys, and ramps; makes turns; and slows or stops. It's usually necessary at slower speeds to let the lead car come to a complete halt before resuming your push to avoid possible damage to bumpers and grilles.

5. Use hand as well as electronic signals for traffic behind you and stay in the outside lane. If the disabled car won't start, push it to a safe place off the highway and call your auto club or a commercial garage for a tow truck.

Do-It-Yourself Towing. "Oh, #!@*&! %*!! (fud!) . . . those damned bumpers don't match up! Now what'll I do for a tow chain?"

PUSHING AND SMOG DEVICES MAY NOT MIX

A push-start may be dangerous for a new reason.

A note in most 1976 and '77 owner's manuals warns drivers not to attempt to push-start their vehicles due to possible damage that may result to the catalytic converter.

Raw fuel can enter the converter while a car is being pushed if the engine turns over but does not ignite. Once the engine is started, the presence of raw fuel may cause the converter to overheat and rupture.

The best emergency towing device (for level to medium-strength pulling) is a heavy nylon cable or strap (available in most auto parts stores, BXs, and ship's stores), because it will stretch and more easily absorb towing jerks. It comes in 12- and 15-foot lengths (the longer is better) and sells for $5 to $6. A twisted or braided steel cable costs about $1 more proportionately but, like a steel or an iron chain, can rub against and cause expensive damage to your car's bumper and sheet metal. In addition, if a metal cable or chain snaps in two, it can injure or kill a person or put an ugly gash in a grille or fender.

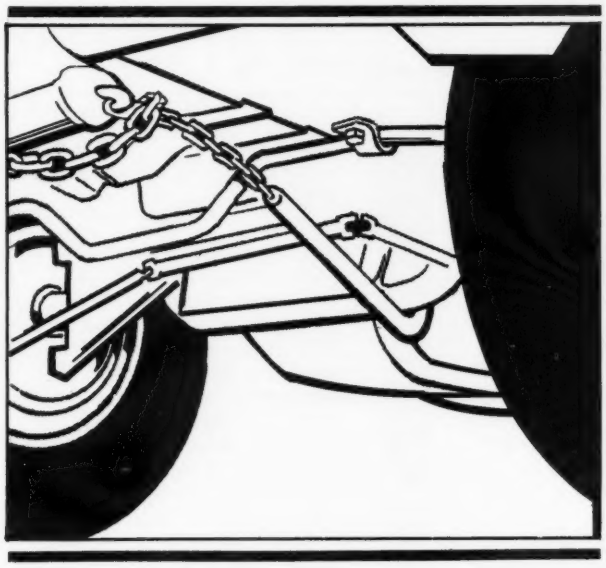
In a dire emergency, you can hook a pair of tire chains together or fashion your own tow rope from odds and ends such as several twists of Scotch filament tape or electrical cable. For do-it-yourself towing, as in pushing, it's important to follow some simple safety procedures:

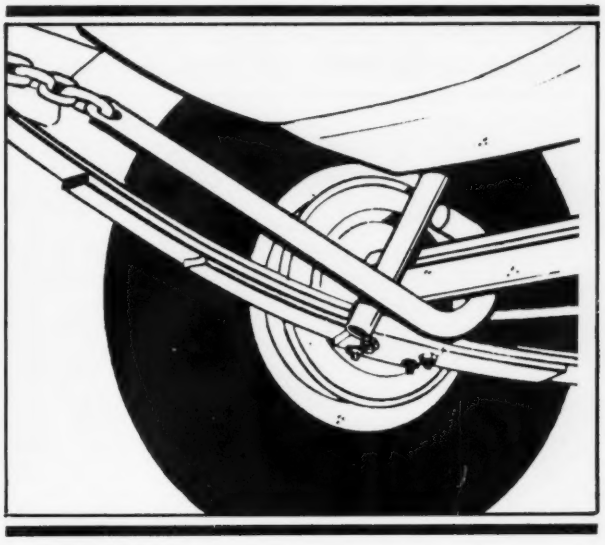
1. Work out a set of hand and horn signals between drivers.

2. Hook the tow cable to a main structural member of the frame, not to the bumper or a bumper bracket. Hook it as close to the center of each vehicle as possible to avoid skewing and jerking in corners.

3. Try to allow about 10 to 12 feet of space between vehicles. Too much space may permit another motorist to mistakenly try to come between your vehicles and cause an accident.

4. If you're the trailing driver, turn on your parking lights and flashers and





gently ride the brake pedal with your foot at all times. When necessary for the tow car to slow or stop, brake for both vehicles in order to keep the tow line taut and to avoid a rear-end collision.

5. **As soon as you reach** the appropriate speed for your car, let the clutch out for a stick shift or engage the automatic transmission in the "Drive" gear.

Bear in mind, doing your own pushing or pulling is for emergency breakdowns only. Follow the rules and you'll save time, frustration, money, and—just maybe—a serious accident.

(EDITOR'S NOTE: Our thanks to Capt Calvin C. Naegelin, Environmental Technical Applications Center (AWS/MAC), Scott AFB, IL 62255 for suggesting the subject of this article. Other readers with ideas for future stories are invited to write or call the DRIVER editor.)

(right, above)
Candidate for a friendly tow by a passing motorist is this snowbound Z-28 Camaro. A little shovelwork, however, is preferable to running the risk of botching up the Camaro's front bumper and gravel shield by a tow chain.

(right)
The owner of this 1975 Datsun-710 will think twice before he pushes another car. When the vehicle he was pushing stopped suddenly, the Datsun's bumper rode under the other bumper with major damages resulting to the Datsun grille and hood.

Do Tires Affect Speedometer?

Have you ever wondered what putting oversize tires on your auto will do to the car's speedometer? Firestone's tire development department has come up with the answer.

If oversize tires (outside diameter in excess of the standard tires) are installed, the speedometer variance is "equally relative in percentages."

In plain talk this means if a tire's outside diameter is 10 per cent greater than the standard-size tire, the speedometer will read 10 per cent less than the correct speed. The car with the 10 per cent oversize tires whose speedometer says it is traveling 40 miles per hour is actually going 44 mph.

Consider this example: Firestone Steel Belted Radial 500, GR 78-15 tires have an outside diameter of 27.32 inches. If a car's four GR 78-15 tires are changed for oversize tires measuring 32.50 inches outside diameter, the increase in outside diameter is 5.18 inches.

The speedometer will be off 19 per cent. If it reads 55 mph, the car really is going more than 65 mph.

Drunk Drivers

Safety investigators have come up with a profile of the drinking driver most likely to cause a fatal accident. He is usually a 25- to 35-year-old male, who is a heavy or problem drinker. In many cases he prefers beer to other alcoholic beverages. He probably has a high school education and drives an older car. He is likely to be single, separated or divorced, and he displays overly aggressive driving habits.

RecVee Thefts Increasing

Own a recreation vehicle? Take care, then, if you want to keep it.

Thefts of RVs are increasing faster across the nation percentagewise than the record annual increase in new units being manufactured. In California alone last year, pilferage of RVs skyrocketed 74% over 1975 while U.S. industry output went up 25%.

Carry-alls and pickups-with-campers are the most

popular targets, according to the California Highway Patrol. Leading the rip-off popularity list were Willys Carryalls of pre-1965 vintage—up from 16th on the most-stolen list a year earlier.

Jeep Carryalls (1970 and prior model years) ranked second followed by Ford pickups with campers (1972 through 1976), Volkswagen campers (1970 and older), and Datsun pickups with campers (1972 and newer).

When an RV is recovered it usually is stripped, which means the camper shell is gone and everything of value in the vehicle has been removed.

More thefts occur during the Spring months of April, May, and June (just around the corner) than any other period of the year. RV thefts in June 1976 alone were up 204% over the same month in 1975 in California with comparable increases in other states.

Temporary CB License

With thousands of military members reported buying CB radio units since the Federal Communications Commission approved the sale and use of 40-channel sets on January 1, it's good to know you can begin transmitting immediately using a temporary license. Here's what to do to stay legal while waiting for a permanent license.

Obtain FCC Forms 505 and 555B, available at CB retailers. Fill out Form 505, an application for a permanent license, and mail it in. Then complete Form 555B, which will serve as a temporary license.

Your temporary call sign will be the letter "K" followed by the initials of your first and last names and your ZIP-code number. For example, the call sign for John Smith, whose ZIP-code number is 12345, would be KJS 12345.

Another must for all CBers is a copy of *Citizen Band Rules and Regulations* (Part 95) which you can easily obtain by sending a check or money order for $1.50 to the Consumer Information Center, Dept. 21, Pueblo, CO 81009. Remember to stay off Channel 9 except for emergency situations and to use Channel 11 only as a calling channel. Keep the chatter down to five minutes, wait one minute between calls, and use call signs to start and finish conversations with your own handle used in between. Self-policing of the CB net is a big 10-4!

TOPICS

Recycling Oil

Oil doesn't wear out, it just gets dirty. And that oil can be recycled and reused. If all waste oils were saved, the nation could gain some 1.1 billion gallons of oil each year, petroleum experts estimate.

So, if you're among the many drivers who change engine oil themselves, take the dirty oil to someone who can get it recycled.

Many service stations will accept the oil and dump it into their reservoirs. Most cities have companies operating crankcase draining services that collect the oil from service stations. You may be able to take it directly to such a company. Look in the yellow pages or ask a gas station owner for names and addresses.

Ford Offers Anti-Rust Warranty On Canada Cars

Buyers of new Fords sold in future years in the United States may receive an anti-rust guarantee if tests now being conducted by Ford Motor Co. in Canada prove out.

After years of criticism over autos that rust out faster than they wear out, Ford has become the industry's first carmaker to offer an anti-rust warranty—but only on 1977 models sold in Canada. If the cars weather the wet and heavily salted roads of the Canadian provinces as well as the company anticipates, and if the cost of maintaining the warranty is not prohibitive, a spokesman says the anti-rust offer may be extended to the U.S., possibly in 1978.

Carbon Monoxide

Chrysler Corporation service department reminds car owners how potentially lethal carbon monoxide can be. That's the toxic stuff that comes from your tailpipe. It's colorless and odorless. To avoid breathing these gases the following precautions should be observed:

Do not run the engine in a closed garage or in confined areas any longer than needed to move your car in or out of the area.

If it is necessary to sit in a parked car with the engine running for more than a short period, adjust your heating or cooling system to force outside air into the car. Set the fan at high speed and the controls in any position except "Off" or "Max A/C".

The trunk lid should be closed while driving to prevent drawing exhaust gases into the car. However, if for some reason the trunk must remain open while moving, adjust heating or cooling system to force outside air into car with blower set at high speed, and controls set in any position except "Off" or "Max A/C". You can also bring outside air into the car by opening the ventilation inlets under the instrument panel.

The best protection against carbon monoxide entry into the car body is a properly maintained engine exhaust system.

Whenever a change is noticed in the sound of the exhaust system, when exhaust fumes can be detected inside the vehicle, or when the underside or rear of the vehicle is damaged, have a competent mechanic inspect the complete exhaust system and adjacent body areas for

broken, damaged, deteriorated, or mispositioned parts. Open seams or loose connections could permit exhaust fumes to seep into the trunk or passenger compartment. In addition, inspect the exhaust system each time the vehicle is raised for lubrication or oil change.

Radial Tires Do Improve Gas Mileage

It's official: The use of radial tires can significantly improve your gasoline mileage over either bias-ply or bias-belted tires, according to tests conducted for the U.S. Department of Transportation. Calspan Corporation measured the rolling resistance of 35 different sets of tires in a 10-month, $50,000 study.

Independent researchers found that radial tires, under normal driving conditions, reduce rolling resistance enough to provide a 6% improvement in gasoline mileage over bias-ply tires. A Calspan engineer said this could mean a savings of one gallon out of every 20. He pointed out, however, that other factors can increase rolling resistance and thereby reduce gasoline mileage, such as inadequate inflation pressure, short-distance trips, and low outdoor temperatures.

IGNITION SYSTEMS

The spark of life for your car

Ignition systems have come a long way from the red hot platinum tube used to ignite fuel in the early 1900s to today's breakerless ignition systems.

In this issue we'll cover late model coil ignition systems, and in the next issue we'll move on to the latest generation of high energy systems.

A Quick History. Until 1914, ignition sources were either the "hot tube" or the high or low tension magneto developed by Robert Bosch and Frederick Simms.

In late 1913, the first real improvement in ignition systems was developed by Charles Kettering at his Dayton Engineering Lab (later known as Delco) for use on the 1913 Cadillac.

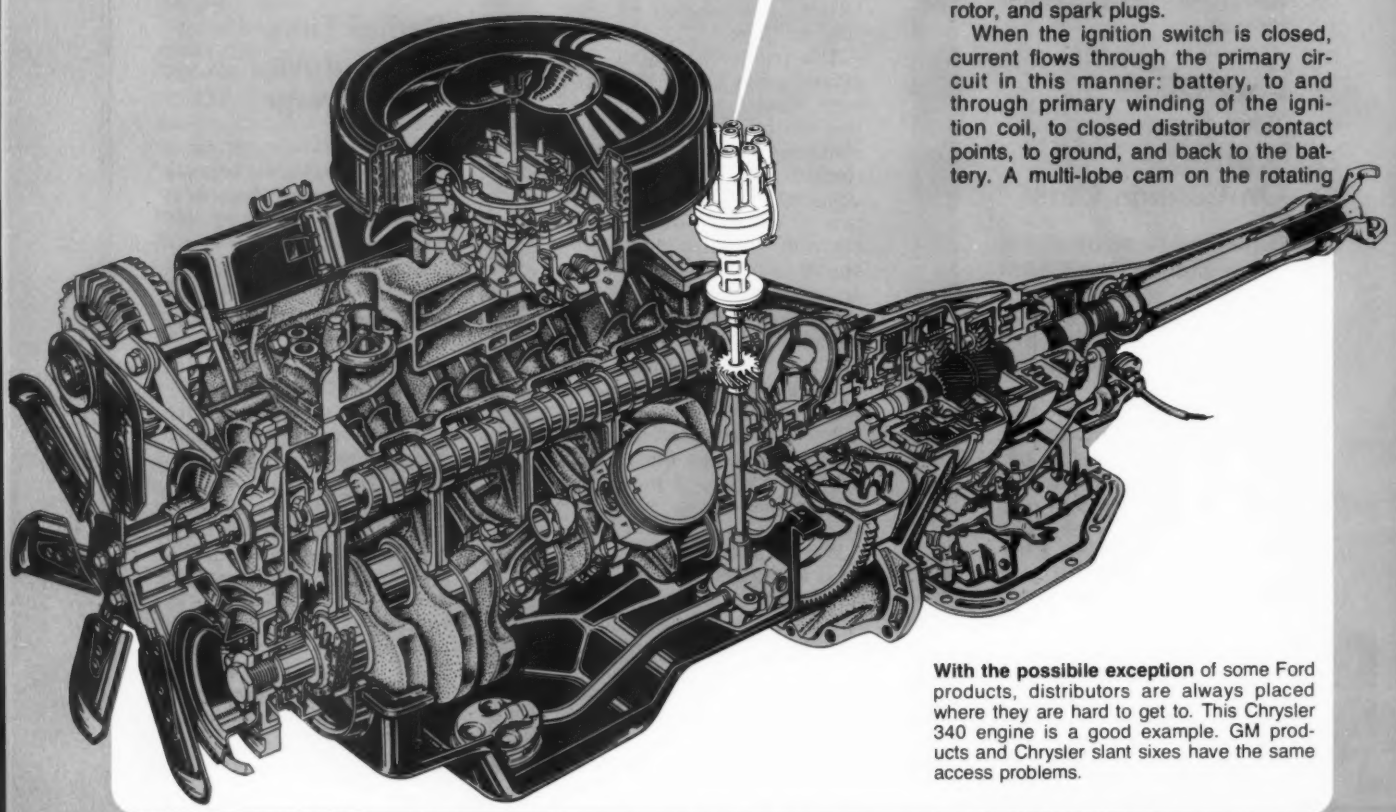
This ignition system, still known today as the Kettering system, is the coil ignition system. It was used from about 1914 until the mid '70s and was the most accurate, compact and efficient ignition system until the advent of the new generation systems.

Ignition Basics. The parts composing the Kettering, or coil ignition system, are the electrical energy source (battery), ignition coil, condenser, distributor, ignition switch, low and high tension wiring, and the spark plugs.

The ignition system is tasked with producing high voltage surges and then directing these surges to the correct spark plug at the correct time. The surges, or sparks, must be timed to arrive at the spark plug at an instant near the end of the piston compression stroke and in reference to the piston position. The spark from the spark plug then ignites the compressed fuel/air mixture, with the resulting explosion forcing the piston back down the cylinder and producing power.

The ignition system involves two individual circuits. One of these is the primary circuit composed of the ignition switch, primary winding of the ignition coil, distributor contact points, and condenser. The other is the secondary (or high voltage) circuit, including the secondary winding of the ignition coil, the high tension lead, distributor cap, rotor, and spark plugs.

When the ignition switch is closed, current flows through the primary circuit in this manner: battery, to and through primary winding of the ignition coil, to closed distributor contact points, to ground, and back to the battery. A multi-lobe cam on the rotating



With the possibile exception of some Ford products, distributors are always placed where they are hard to get to. This Chrysler 340 engine is a good example. GM products and Chrysler slant sixes have the same access problems.

distributor shaft causes the contact points to open and close. When the points open, the current decreases rapidly in the primary winding of the ignition coil and a high voltage is *induced* in the coil's secondary winding (more about the phenomenon of *induction* later).

This induced high voltage flows through the distributor cap to the rotor, through the spark plug lead and to the spark plug. The voltage arcs from the center electrode of the plug to the ground or angle electrode, igniting the air/fuel mixture.

The secondary current flows from the coil secondary winding, across the distributor rotor gap and spark plug gap, and back to the secondary winding through ground, the battery and the ignition switch. The contact points then reclose and the cycle repeats. The next-firing spark plug will then be the one connected to the distributor cap insert that is aligned with the rotor when the contact points separate. With the engine running, current flows through the coil primary calibrated resistance wire; the other lead connected between the coil and solenoid terminal is a bypass feature (more about this under COILS).

When the contacts separate, a high voltage is induced in the coil's primary winding. This voltage (about 250 volts) causes an arc to form across the contact points. In order to quickly stop and control the primary current and prolong contact point life, a capacitor (called a condenser when installed in ignition systems) is electrically connected across the points.

Distributor Function. When you open the hood, one of the first things you see is a plastic device with a multitude of wires leaving the top and scattering around the engine in different directions . . . it's the distributor. Don't worry though, it's not as complicated as it looks.

A distributor has three basic functions. One is to open and close the low tension circuit between the battery and the coil so that the primary winding of the coil is supplied with intermittent surges, or

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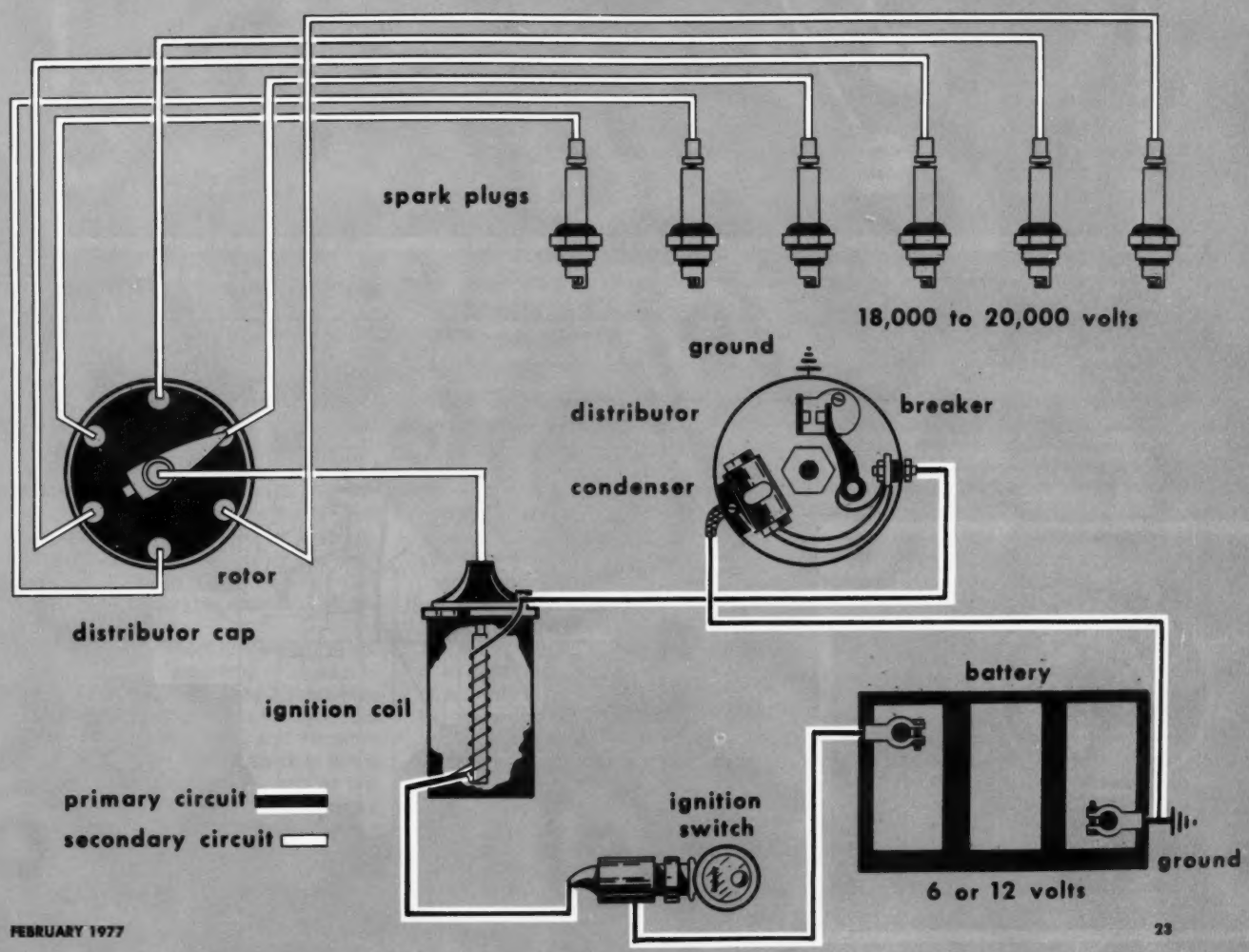
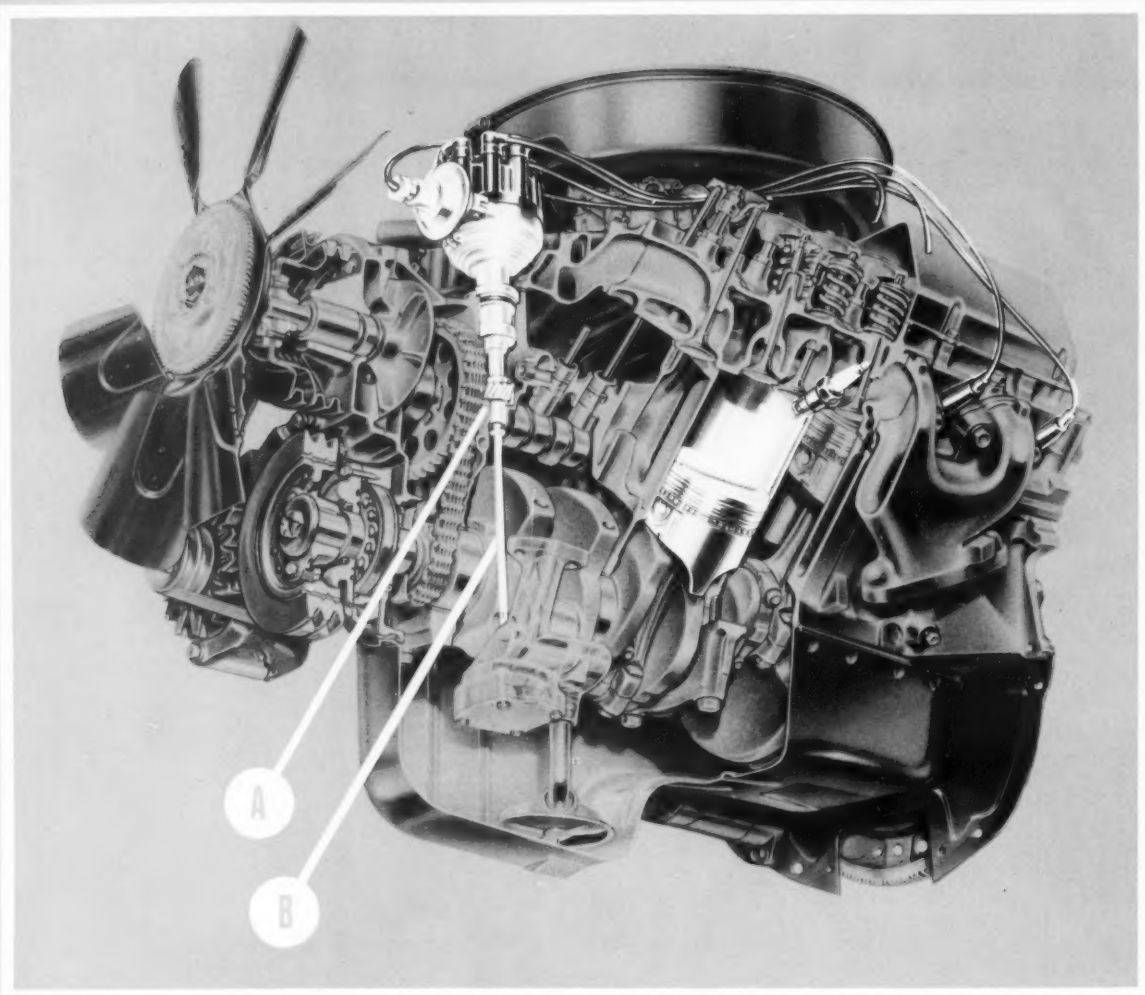
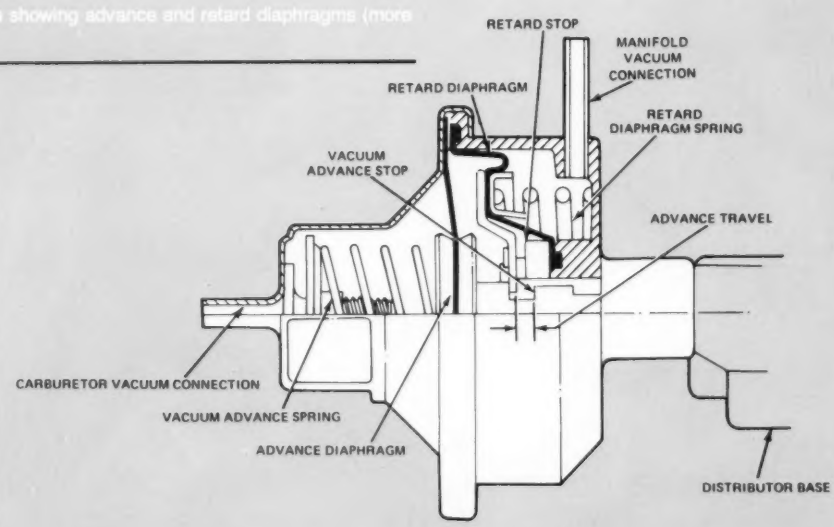
This pictoral of the Kettering ignition system illustrates that the system hasn't changed much since 1914. Detail improvements have been made, but components remain basically the same.



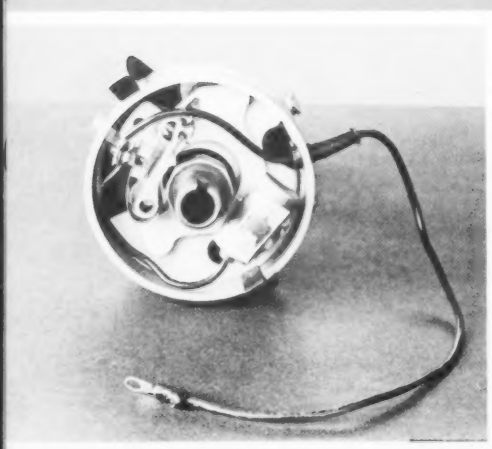


This cutaway reveals that, in some engines, the distributor has two functions. Drive for the distributor comes from gear on the camshaft (A) and distributor driveshaft has an extension (B) that is used to drive the oil pump.

(right)
Cutaway of vacuum advance mechanism showing advance and retard diaphragms (more in text). *(Courtesy Ford Motor Co.)*



(below)
Distributor for eight-cylinder car has eight lobes on cam, and shows slot used to index rotor, location of points and condenser.



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spikes, of current. Each spike builds up a magnetic field within the coil. The distributor then opens its circuit so that the magnetic field will collapse and cause the coil's secondary windings to produce a high voltage surge (for more info, see Coils).

The second function is to time these voltage spikes with regard to engine requirements. This is accomplished by the centrifugal and/or vacuum spark advance mechanisms.

The last function is to distribute or direct the spikes through the rotor, cap, and high tension wiring to the spark plug that is ready to fire next.

The typical Kettering system distributor consists of a housing, drive shaft, centrifugal advance assembly, vacuum advance diaphragm and linkage, breaker plate assembly, condenser, rotor, and distributor cap.

The distributor cap, rotor, and high tension leads form the system which directs the high voltage impulses to the spark plugs in correct sequence.

The breaker plate assembly contains the breaker lever, the contact support, and the condenser. When the point cam attached to the distributor drive shaft rotates, each cam lobe contacts the breaker lever rubbing block and causes the points to separate, which in turn creates the voltage spikes mentioned earlier. With every breaker point cam revolution, one spark will be produced for each cylinder (remember though, since each cylinder fires at every other crankshaft revolution in a four-stroke engine, the distributor therefore rotates at half engine speed).

The distributor shaft and weight-base assembly is fitted with bearings and rotates inside the distributor shell or housing. Centrifugal advance weights are pivoted on studs in the weight base or on the bottom of the breaker plate, and are free to move away from the shaft and work against calibrated advance springs connected to the breaker cam assembly. The breaker cam assembly slip fits on the top of the shaft and rotates with the shaft, being driven by the weight springs activated by the advance weights.

Outward movement of the weights advances the cam assembly in relation to the shaft as engine speed increases (i.e., the more engine speed, the more the spark is "advanced") and therefore provides a means for the spark to arrive at the spark plug earlier than at low speed. Each engine model requires an individual spark advance "curve" to insure delivery of the spark at the right instant for maximum power at all engine speeds.

An improvement in fuel economy on engines operating under part throttle conditions is realized by supplying additional spark advance. Vacuum advance mechanisms are provided for this purpose. Engine vacuum from the intake manifold is routed to a diaphragm connected to the breaker plate, and the breaker plate rotates to provide an earlier, or advanced, spark.

Centrifugal Advance. The centrifugal advance mechanism (weights and springs) times the high voltage spike produced by the ignition coil so that it is delivered to the plug at the correct time, as determined by engine speed.

When an engine is idling, the spark is timed to arrive at the plug just before the piston reaches the apex of its travel (TDC or top dead center). At higher engine speeds there is a shorter interval of time available for the fuel/air mixture to ignite and burn. Consequently, it's necessary to deliver the spark earlier in the combustion cycle to insure complete ignition and burning of the fuel.

The centrifugal advance mechanism, consisting of two weights and springs, determines the amount of the spark advance. The weights are thrown out (due to centrifugal force) against spring tension as the distributor shaft rotates with increased speed. The motion of the weights turns the breaker cam assembly so that the breaker cam is rotated in the direction of shaft rotation to an advanced position with respect to the distributor drive shaft. The higher the engine speed, the further the weights cause the cam to rotate, thus advancing the spark earlier into the combustion cycle.

Vacuum Advance. Since centrifugal advance isn't really effective at low engine speeds we must have another means of advancing the spark under conditions of low engine speeds or partial throttle openings. This low speed advance is accomplished by the vacuum advance system.

The vacuum advance mechanism has a spring-loaded diaphragm connected by linkage to the distributor breaker plate. The spring-loaded side of the diaphragm is air-tight, and is usually connected to an opening in the carburetor. This opening is on the atmospheric side of the throttle plate when the throttle is in the idling position. In this position, there is no vacuum.

When the throttle is partially opened, it swings past the opening of the vacuum port. Intake manifold vacuum can then draw air from the air-tight chamber in the vacuum advance mechanism and this causes the diaphragm to be moved against the spring. This motion is transmitted by linkage to the breaker assembly. Total vacuum advance is governed by the amount of vacuum in the intake manifold, up to a limit imposed by the design of the diaphragm and linkage assembly.

Dwell Angle. Dwell, often referred to as contact angle or cam angle, is the number of degrees of cam rotation during which the points remain closed. It is during this period that the current in the primary coil winding increases. Although the cam angle may not change, the length of time the contacts remain closed decreases as engine speed increases. At higher engine speeds, the ignition coil primary current doesn't reach its maximum value in the short length of time the points are closed. In order to store the maximum amount of energy obtainable from the coil, and thereby obtain sufficient energy to fire the plug, a breaker lever assembly that will operate well at high speeds is necessary. The distributor is equipped with a special high-rate-of-break cam and a special high speed breaker lever which is capable of following the cam contours at high speeds without "bouncing." The high-rate-of-break cam separates the points faster for each degree of rotation and permits closing earlier, thus effectively increasing dwell.

Condenser. The ignition condenser is a capacitor consisting of a roll of two layers of thin metal foil separated by a thin sheet of insulation. This assembly is sealed in a small metal can with a flat washer providing a tight seal.

The high voltage induced in the coil primary winding causes the condenser plates to charge when the contacts first separate; the condenser then acts like a short circuit and current flows into the condenser to minimize arcing at the points.

Coil. The ignition system wouldn't be of much help if it didn't have high voltage to deliver to the plugs. In order to develop this high voltage, we rely on the ignition coil.

An ignition coil is essentially a pulse transformer that steps up the low voltage from the battery or alternator to a voltage high enough to ionize the spark plug gap and ignite the air/fuel mixture in the cylinder.

A typical coil is made up of a primary winding consisting of a few hundred turns of relatively large wire, and a secondary winding involving many

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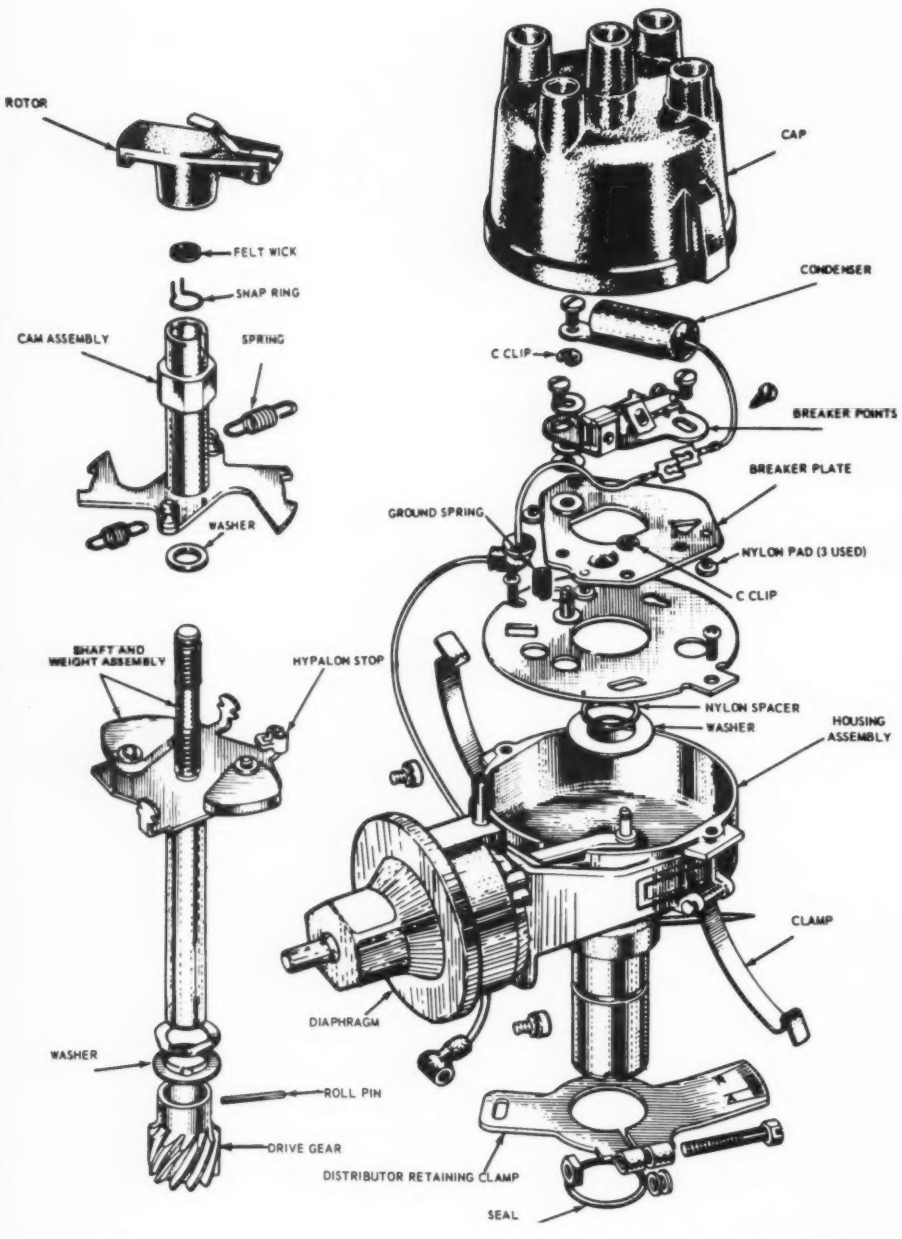
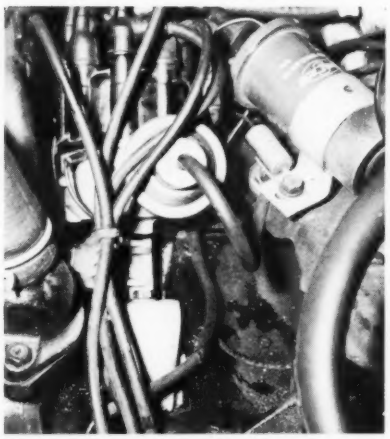




General relationship of distributor, vacuum advance mechanism, and ignition coil. White wedge-shaped object in center is distributor hold-down mechanism. When distributor timing must be changed (like during a tune-up) hold-down clamp must be loosened to allow distributor to be manually rotated.

(right)
IPB (internal parts breakdown) of Pinto distributor gives general idea of configuration of most conventional distributors. Note use of small nylon pads under breaker plate to ease friction.
(Courtesy Ford Motor Co.)

thousands of turns of very small wire. These windings are assembled over a soft iron core and enclosed by a soft iron shell. This assembly is then fitted into a one-piece steel or aluminum shell which is then filled with oil and hermetically sealed by a coil cap of molded high-dielectric (insulating) material.

Coils are sealed to prevent entrance of moisture which could cause coil failure. During manufacture, the coil case is filled with hot oil. As the oil temperature decreases to room temperature, the oil contracts, thus allowing room for expansion when the coil heats up during normal operation. The oil also acts as an insulator to prevent voltage arc-over within the coil.

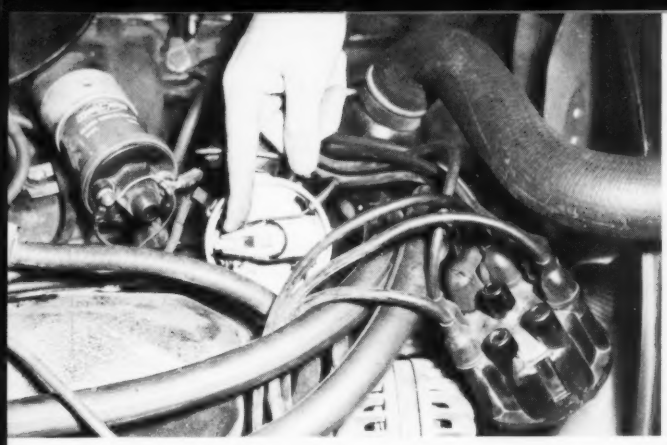
In an ignition system, sufficient primary circuit resistance must be present to protect the points from excessive arcing or burning. In some systems, part of this needed resistance may take the form of a separate resistor or calibrated resistance wire connected between the ignition switch and the coil primary terminal.

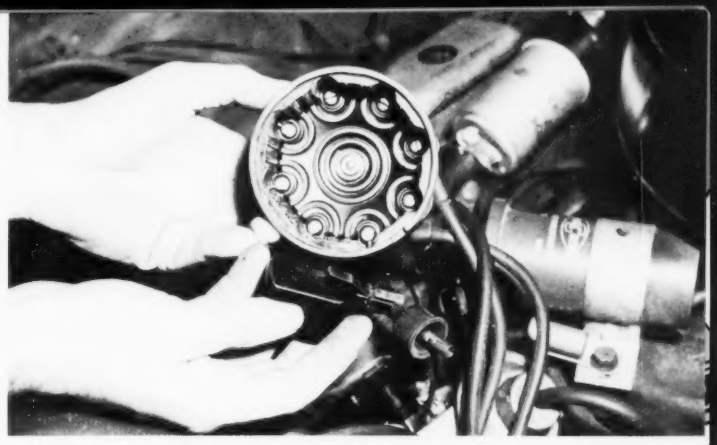
During cranking, most external resistances are bypassed to provide full battery power to the coil to aid in starting. The higher currents developed during cranking are not sufficient to cause point deterioration because of the short periods of time spent cranking. Also, the lowered battery voltage during cranking causes a lower primary current, so the resistor bypass feature is an offsetting feature. Bypassing the resistor with the engine operating will cause rapid deterioration and failure of the points.

The Final Link. The final link in the ignition chain is the spark plug. This device, which appears so simple externally, is actually so complicated in its operation and relation to engine performance that we're going to do a separate BYM for spark plugs.

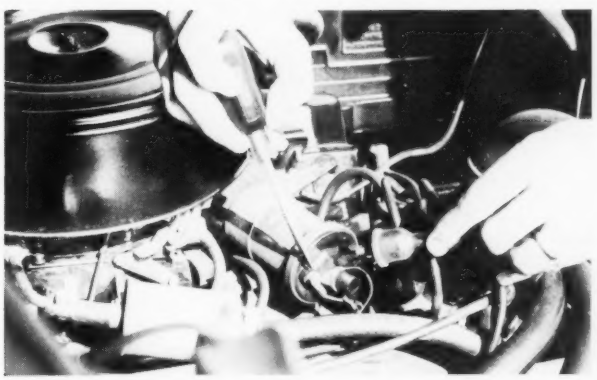
Next month, we'll cover BEIs, HEIs, LEDs, and X-sistors . . .'and we'll even explain what all those initials stand for!

(DRIVER wishes to thank Mr. Joe Hallett of Action Auto Parts, San Bernardino, CA, for providing the distributors photographed for this article.)

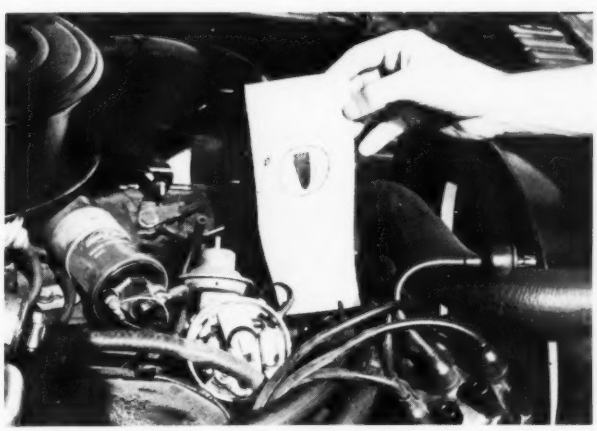


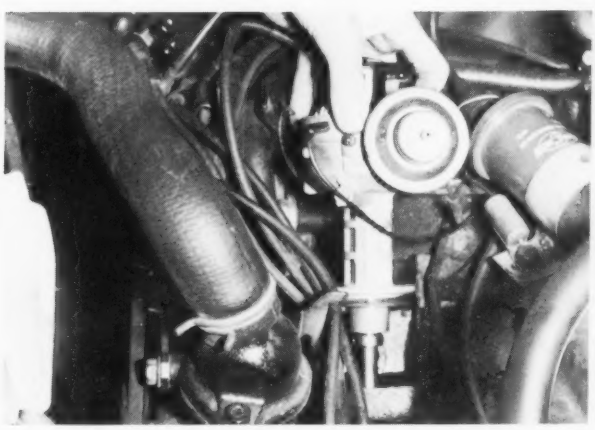


left: With distributor cap removed, the first thing you see is the rotor. Rotor contact end can become pitted with extended use, and contact spring piece on top may lose tension. Rotor is a slip fit on distributor shaft and will have an internal projection to match a slot on distributor drive shaft to insure correct orientation. ***right:*** Distributor cap should be checked occasionally for cracks and contact wear. A bad distributor drive shaft can wobble and allow the rotor to impact the metal contact points imbedded in the cap. The center graphite contact button may lose its spring-loading and not make sufficient contact with the rotor to insure complete ignition.



left: This is the easy way to change points! While we don't advise removing the distributor to change points, we do want to use this picture to point out that the screws that secure the points can be easily lost into one of the holes in the breaker plate . . . and you *will* have to remove the distributor! ***right:*** All ignition coil connections should be tight and free of corrosion. Any dirt on terminals can cause some of the high voltage to "run off" and may result in insufficient voltage to the spark plugs.





left: If, for some reason, you find it necessary to remove the distributor, first make an illustration like this. It shows the position of the rotor relative to some reference point like the vacuum advance. Since the distributor drives uses helical instead of straight cut gears, the shaft will rotate as it's removed. Unless you know the correct final rotor orientation (by your drawing) you probably won't get the distributor back in correctly. ***right:*** This is about the point where the drive gears will begin to mesh. As you go further in, shaft will turn. If you haven't made your drawing, you won't know where the rotor is supposed to be oriented. Also, in some cars, you won't be able to get the distributor all the way in because the drive shaft extension won't mate with the oil pump shaft correctly. Like we said, make that drawing *before* you pull that distributor!

BACKFIRE

USE OF SAFETY GEAR

We need a movement towards responsibility in this country. Too many people think it's up to Uncle Sam to tell us how to behave. People will react to certain situations according to the cost and benefits, not moral or legal implications. Sociologists and economists have proven by tests that a person won't do a certain act if it costs money, time, or embarrassment. They will take a chance if it's quick, easy, and involves little risk.

Instead of regulations and the added bureaucratic hassle of enforcement by our government, the insurance companies should launch a national campaign to change their rules as Maj Campbell suggested in your September 1976 issue. They have many rules of coverage of persons injured while flying for the Air Force, unless they pay a special premium. The same should apply for the wearing of seat belts and helmets.

I wear a helmet while riding my snowmobile. Whether there is a law about it or not, it just makes good sense. And I've got somewhat soft snow to land on and less chance than a motorcycle of colliding with a car.

I had an interesting time water skiing last summer. I had to convince my wife (a nonswimmer) to wear a life jacket in the middle of a large lake. My niece and nephew, and my brother-in-law refused to wear theirs for various reasons, including trying to get a tan. I had many reasons for wearing mine, although I can swim fine without one.

It is illogical to me to pay for safety equipment that is not used. We also used a ski vest, not a belt, which made it a lot more fun, and it helped to keep us from hitting the water as hard as we would have without one.

C'mon, all you boaters, drivers, bikers, etc., is it really all that hard? If you really like your freedom so much, do you want to spend it confined to a hospital room? Be free to make the RIGHT choice, not one for the sake of argument.

SSgt Dean E. Schlotfeldt, USAF
USAF Hospital/SGPF
Kincheloe AFB, MI 49788

SELF-SERVICE

Your auto inspection and servicing procedures discussed in the December '76 article, "Self-Service: Gas Up 'n' Go?" are fine. I have been doing it myself for over 25 years. But why at the gas station? Why not at home?

You can store your tools and supplies, instead of hauling them with you. You can perform the work at your convenience, in suitable clothes, without holding up other customers. And you can perform the cold inspection items (tires, radiator, etc.) before starting, leaving the hot items (transmission, power steering, etc.) for the return home.

If tire pressures are found to be low, you can stop at a station and air up as necessary. Since the pressure will increase during driving, I take a pressure reading at the station and then increase the pressure by the amount it was low during the cold reading. Another advantage of home-based inspections for me is that I can OJT my teenagers.

Lt Col R. J. Vanden-Heuvel, USAF
Eglin AFB, FL 32542

We couldn't agree more with your method of maintaining a car. The facts are, however, that many of our readers either can't or just don't service their vehicles at home; it's better then to do it at a service station than not at all. Our "how-to" tips can be used anywhere.

PROTECTIVE PACKAGING DURING CRASHES

I very much enjoyed your "Scuba Diving" and "Happiness Is Year-Round RVing" articles (August '76), but I'd like to comment on the letter of YN1 Simmons. I've been riding motorcycles for several years, and I readily agree that a motorcycle provides no protection in a collision. But, YN1 Simmons made reference to a 50 mph head-on collision with a tractor trailer. Well, I wouldn't give you a penny for the protection my Pontiac Ventura would provide under those circumstances.

I ride about 36 miles to and from work each day, mostly on an interstate at 55 mph, on my Honda CL350. I am fully aware of the fact that I will die if I have an accident at that speed.

From my own experience and from tips provided from DRIVER's excellent motorcycle articles, I feel confident of never having an accident on my cycle. I don't base this confidence on YN1 Simmons' "four tires, a chunk of metal and a roof over my head." I base it on good vehicle maintenance, full awareness of road conditions and my vehicle's limitations, and constant alertness. I'm not content to box myself inside a mass of steel and wait patiently for an accident to happen; I am, rather, content to enjoy my motorcycling and, at the same time, to use proper driving habits to prevent an accident. Motorcycles provide no guarantee of rider safety, but neither do cars, trucks, aircraft, or ships. Safety and staying alive are the operator's responsibility.

Sgt Stephen W. Norlander, USA
HHC, 1st Brigade
Fort Carson, CO 80913

Your point about over-estimating the protection afforded by the car's steel body is well taken. Most people are amazed to see the damage done to automobiles that are crashed into stationary objects at 10 or 15 mph during controlled testing done by the Department of Transportation.

BIRDS, BEES, AND A HELMET

I read your magazine whenever I can get my hands on one, and in particular the sections about motorcycles.

Lately there has been a great deal of controversy over wearing helmets. I would like to tell of two times I was very happy to have one of those jewels on. The first time I was cruisin' down a country road when all of a sudden—POW! I thought my head got ripped off. When I pulled over and took my helmet off, I found a giant yellow jacket had decided he had the right of way. The second time, I was driving off base when a small bird rammed into the side of my helmet. He almost knocked me off my bike. He accomplished putting a small hole in the side of the helmet.

All I can say about helmets is, thank God we're not still wearing the leather kind. If some idiot doesn't mind a few holes in his head, good for him. But I'm going out and getting the best helmet on the market.

Thanks for the help from all us two wheelers.

HM3 Thomas M. Fink, USN
USS CALOOSAHATCHEE (A0-98)
FPO New York 09501

letters to the editor

Address your letters to:
Editor
DRIVER Magazine
AFISC/SEDD
Norton AFB CA 92409

SMOKING POT

I would like to wish the continuance of good luck to the author of the unsigned letter in the Oct '76 issue. I sincerely hope that when he goes down, he takes no one else with him.

Admitting the lack of concentration and the tendency to overlook things when driving, coupled with the questionable practice of apparently slowing down when driving an automobile, but not his motorcycle, says a lot for his judgment while using pot and vehicles. I suppose that goes along with the statements that one shouldn't use pot if he can't take it, but also stating that pot use has affected his recall and vision. UNSIGNED should be changed to CONFUSED.

I would strongly pray that for his own good, and others that could be affected by him, that he lay off the pot for a few days and take a good, hard look at his own letter.

Capt Billy J. Harris, USAF
Air Force Advisor
241st EIS
Chattanooga, TN 37421

AIR CONDITIONERS—SIGHT GLASS

In your August '76 "Backyard Mechanic" article on air conditioners, page 25, you said to start poking around to clean off the sight glass with a rag while the engine is running. If you check a number of cars in a parking lot, you will note that the sight glass is usually near the evaporator, which in turn is near the fan. While using a rag near the fan isn't as bad as wearing a tie while doing the same, it should cause some concern. You said to exercise caution, but why expose the reader to a potentially dangerous situation?

Since the object of the exercise is to have a *clean* sight glass, why not clean it off with the *engine off?* Then the mechanic could use a rag (which really isn't practical anyhow, unless he uses the eraser end of a pencil as well as the rag), a cotton swab or anything else handy—in safety—without worrying about (1) the rag getting caught in the moving fan and (2) dragging his hand into the fan.

Maj Martin L. Kaufman, USAF
HQ USAF (AF/IGYA)
Wash, DC 20330

PRE-TRIP EXAM FOR REC-VEES

Your article, "Happiness is Year-Round RVing" (August '76), was a welcome sight. As a 10-year veteran of RV sales and service (factory-trained by Airstream), I have been constantly amazed at the lack of knowledge and preparedness of the majority of RVers on the road. I did note a couple of things that I feel would be of value to your RV readers:

Item 12 of your "Pre-trip Exam for Rec Vehicles": The LP (liquid petroleum) regulators on 99.99% of the RVs delivered to dealers have not been set. Even if they were, they'd need to be reset by the dealer for the user's altitude. An inexpensive gauge for LP pressure (instructions included) is a valuable item for the traveler who will be experiencing varied altitudes (more than 1,000 feet). Failure to adjust can cause inadequate or excessive pressure, resulting in blow-outs and possible explosion, if the safety device fails.

HELP THE AIR FORCE

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AIR FORCE
A great way of life.

Don't forget—an excellent hitch lubricant that doesn't build up is a spray can of furniture polish such as Pledge.

Again, my compliments on a very valuable article.

SSgt Larry D. Robertson, USA
Reserve Components Career Counselor
HQ Fort Carson, CO 80913

We concur in your thoughts about most RVers–they need to be better prepared for the road. Thanks, too, for the tips.

STUDDED SNOW TIRES

I just finished your informative Winter Driving article in the October 1976 issue and am writing to point out the omission of a word that may mislead some of your readers. In your last reminder to the readers you stated that " . . . snow tires; because of the added damage they do to highways, snow tires are restricted by many states to only certain months of the year. A few states and some parts of Canada, in fact, ban their use entirely."

The word "studded" should have preceded all of the above mentioned snow tires as snow tires to my knowledge are not restricted or banned in any state.

I find your publication most informative and while it should have been obvious to all readers that you were referring to studded tires, one never knows.

Mr. Michael J. Right
Auto Club of Missouri
Maryland Heights, MO 63043

Right on, Mike!

☆U.S. GOVERNMENT PRINTING OFFICE: 1976—683-613/16

EMERGENCY!

submersion of your car

Emergencies of this nature are very rare and unpredictable. Speedy and proper reactions by the driver and passengers are more critical than in any other type of emergency situation. So, if your car goes through a bridge railing or over an embankment into deep water, these tips can help you survive:

■ Cars with their windows and doors closed will float for at least a few minutes. Don't try to open a door to get out because the water pressure will make it very difficult. Windows can be rolled down easily, so open the window (windows in case of passengers) and use the opening as an escape route.

■ If you have power windows, open them immediately before they short out. If they do short out and won't open, your only recourse is to try to break them out with a heavy, hard object. The tempered glass used in modern cars is hard to break.

■ If you can't open or break a window and must open a door, remember—cars with engines in the front will sink nose first. This will push some air to the rear of the car near the roof, giving you some breathing air while you are working on escape. This air will also help to equalize the pressure and make it easier to open a door.

NOTE: If you have been tossed about and knocked unconscious because you haven't worn your seat belt, NONE OF THESE MEASURES WILL HELP YOU. WEAR YOUR RESTRAINTS!

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